E-7

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
least possible number of additional second nodes, the path to the first node through the most robust additional second nodes, the path to the first node through the second nodes with the least amount of traffic, and the path to the first node through the fastest second nodes.	"The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
	approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13.

The '314 Patent – Claims	Leiner Reference
	"One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
10. A client node in a network including a server node having a server radio modem and a server controller which implements a server process that includes controlling the server node to receive and transmit data packets via said server node to other nodes in the network, the client node comprising: a client node radio modem; and a client node controller; said client node controller implementing a process including receiving and transmitting data packets via said client modem;	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22], Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED?

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
	Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
selecting a radio transmission path to said server node that is one of a direct link to said server node and an indirect link to said server node through at least one other client node;	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20]. If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
implementing a process requesting updated radio transmission path data from said server node, and in response thereto, implementing by the server node changes to upgrade the selected transmission path to an optimized transmission path.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
	"Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
	"Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet

The '314 Patent – Claims	Leiner Reference
	or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
12. A first node providing a gateway between two networks, where at least one of the two networks is a wireless network, said first node comprising: a radio modem capable of communicating with a first network that operates in part, by wireless communication; a network interface to communicating with a second network; a digital controller coupled to said radio modem and to said network interface, said digital controller communicating with said first network via said radio modem and communicating with said second network via said network interface, said digital controller passing data	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
packets received from said first network that are destined for said second network to said second network, and passing data packets received from said second network that are destined for said first network to said first network,	work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
said digital controller maintaining a map of data packet transmission paths to a plurality of second nodes of said first network, where a transmission path of a second node of said first network to said first node can be through one or more of other second node of said first network;	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
wherein said digital controller changes the transmission paths of each of the second nodes to optimize the transmission paths including changing each transmission path from on of the plurality of said second nodes to the first node so that the path to the first node is chosen from the group consisting essentially of the path to the first node through the least possible number of additional second nodes, the path to the first node through the most robust additional second nodes, the path to the first node through the second nodes with the least amount of traffic, and the path to the first node through the fastest second nodes.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13.

The '314 Patent – Claims	Leiner Reference
	"Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
	"Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
	or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
13. A first node as recited in claim 12, wherein the digital controller translates data packets received from the second network and destined for the first network into a format used by the first network, and the digital controller converts data packets received from the first network and destined for the second network into a format used by the second network.	"1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
	destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
14. A first node providing a gateway between a wireless network and a second network, the first node comprising: a first data packet receiver implementing a process to receive a data packet from a second node of said wireless network, a first converter implementing a process to convert said data packet to a format used in said second network, and a first transmitter implementing a process to transmit said data packet to a proper location on said second network; and a second data packet receiver implementing a process to receive a data packet from said second network, a second converter implementing a process to convert said data packet to a format used in said wireless network, and a second	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways,

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
transmitter implementing a process to transmit said data packet with a header to a second node of said wireless network; and	normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
a controller implementing a process to change a transmission path to optimize a transmission path includes changing the transmission path from the second node to the first node so that the path to the first node is chosen from the group consisting essentially of the path to the first node through the least possible number of additional second nodes, the path to the first node through the most robust additional second nodes, the path to the first node through the second	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12.

The '314 Patent – Claims	Leiner Reference
nodes with the least amount of traffic, and the path to the first node through the fastest second nodes.	"Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity

The '314 Patent – Claims	Leiner Reference
	information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '314 Patent – Claims	Leiner Reference
	to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.

Invalidity Chart for U.S. Patent No. 8,233,471

The '471 Patent – Claims	Leiner Reference
2. A wireless network system comprising: a server including a server controller and a server radio modem, said server controller implementing a server process that includes the control of said server radio modem, said server process including the receipt and transmission of data packets via said server radio modem; and a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes the control of said client radio modem, said client process including the receipt and transmission of data packets via said client radio modem,	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue

The '471 Patent – Claims	Leiner Reference
	arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20]. If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	information." Leiner at 13-14.
wherein said server process further includes logic that maintains a client link tree having client link entries corresponding to an optimized transmission path for each of the plurality of clients, and	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
wherein the server process is configured to: receive the selected transmission path from each of the plurality of clients, determine the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the optimized transmission path, and send the optimized transmission path for each of the clients to the respective clients.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13.

The '471 Patent – Claims	Leiner Reference
	"Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
3. A wireless network system as recited in claim 2, wherein said server process further comprises: logic that compares a selected link from said client to said server to a current client link entry in said client link tree; and	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.

The '471 Patent – Claims	Leiner Reference
logic that updates said client link tree when said comparison meets predetermined conditions.	"The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on

The '471 Patent – Claims	Leiner Reference
	any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and

The '471 Patent – Claims	Leiner Reference
	robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
4. A wireless network system as recited in claim 3, wherein said server process further comprises: logic that determines if said client is authentic; logic that determines if said client is already in said client link tree if client is determined to be authentic; logic that deletes said client from said client link tree if said client is already in said client link tree; and logic that inserts said client in said client link tree if said client is authentic.	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
6. A wireless network system comprising: a server providing a server process including: receiving data packets via a server wireless communication, sending data packets via said wireless communication, communicating with a network, and performing housekeeping functions; and a plurality of clients, each client providing a client process including sending and receiving data packet via a client wireless communication, maintaining a send/receive data buffer in digital memory, and	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is

The '471 Patent – Claims	Leiner Reference
	concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
wherein said server process further comprises maintaining a client link tree having client link entries corresponding to an optimized transmission path for each of the plurality of clients, and	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
wherein the server process is configured to: receive the selected transmission path from each of the plurality of clients, determine the optimized transmission	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision

The '471 Patent – Claims	Leiner Reference
path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the optimized transmission path, and send the optimized transmission path for each of the clients to the respective clients.	must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved

The '471 Patent – Claims	Leiner Reference
	by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The

The '471 Patent – Claims	Leiner Reference
	centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
7. A wireless network system as recited in claim 6, wherein said server process is further configured to: compare a selected link from said client to said server to a current client link entry in said client link tree; and update said client link tree when said comparison meets predetermined conditions.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual

The '471 Patent – Claims	Leiner Reference
	network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
8. A wireless network system as recited in claim 7, wherein said server process is further configured to: determine if said client is authentic; determine if said client is already in said client link tree if client is determined to be authentic; delete said client from said client link tree if said client is already in said client link tree; and insert said client in said client link tree if said client is authentic.	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network

The '471 Patent – Claims	Leiner Reference
	access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
10. A method for providing wireless network communication comprising: providing a server implementing a server process including receiving	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
data packets via RF transmission, sending data packets via RF transmission, communicating with a network, and performing housekeeping functions; and providing a plurality of clients, each client providing a client process including sending and receiving data packet via RF transmission, maintaining a send/receive data buffer in digital memory, and	operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20]. If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
wherein the server process: receives the selected transmission path from each of the plurality of clients	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as

The '471 Patent – Claims	Leiner Reference
determines the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients updates the client link entries to provide the optimized transmission path, and sends the optimized transmission path for each of the clients to the respective clients.	exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks,

The '471 Patent – Claims	Leiner Reference
	where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated

The '471 Patent – Claims	Leiner Reference
	with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
11. A method as recited in claim 10, wherein said server process further includes: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and

The '471 Patent – Claims	Leiner Reference
	forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high

The '471 Patent – Claims	Leiner Reference
	rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
12. A method as recited in claim 11, wherein said server process further includes: determining is said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is already in said client link tree; and inserting said client in said client link tree if said client is authentic.	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the

The '471 Patent – Claims	Leiner Reference
	network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
14. A method for providing wireless network communication comprising the steps of:	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all

The '471 Patent – Claims	Leiner Reference
a server process including a data packet reception step, a data packet transmission step, a network communication step, and a housekeeping step; and a plurality of clients each providing a client process including a data sending and receiving step, a send and receive data buffer maintenance step, and	radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22], Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway

The '471 Patent – Claims	Leiner Reference
	and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
a link selection step that is one of a direct link to a server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
wherein said server process further comprises the step of maintaining a client link tree having client link	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
entries corresponding to an optimized transmission path for each of the plurality of clients, and	determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
wherein the server process: receives the selected transmission path from each of the plurality of clients, determines the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the optimized transmission path, and sends the optimized transmission path for each of the clients to the respective clients.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has

The '471 Patent – Claims	Leiner Reference
	each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact,

The '471 Patent – Claims	Leiner Reference
	is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
15. A method as recited in claim 14, wherein said server process further comprises the steps of: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	"Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	(with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example,

The '471 Patent – Claims	Leiner Reference
	based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
16. A method as recited in claim 15, wherein said server process further comprises steps of:	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon

The '471 Patent – Claims	Leiner Reference
determining if said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is already in said client link tree; and inserting said client into said client link tree if said client is authentic.	the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
17. A wireless network system comprising: a first node including a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling of said first node radio modem, said first node process including receiving and transmitting data packets via said first node radio modem; a plurality of second nodes each including a second node controller implementing a second node process that includes controlling a second node radio modem, said second node process including receiving and transmitting data packets via said second node radio modem,	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an

The '471 Patent – Claims	Leiner Reference
	additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
wherein said second node process of each of said second nodes includes initiating a radio transmission path to said first node that is a link to said first node through at least one of the remainder of said plurality of second nodes; and	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example,

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
wherein said first node process dynamically updates a second node link tree comprising second node link entries and dynamically modifies the second node link tree so that the data packet transmission from the first node is optimized.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination

The '471 Patent – Claims	Leiner Reference
	pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.

The '471 Patent – Claims	Leiner Reference
	"This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
18. A wireless network system as recited in claim 17, wherein at least one of the second nodes is a mobile device and said first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and logic dynamically updating said	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
second node link tree when said comparison meets predetermined conditions.	the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE

The '471 Patent – Claims	Leiner Reference
	PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
19. A wireless network system as recited in claim 18 wherein said first	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within

The '471 Patent – Claims	Leiner Reference
node process further comprises: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; and logic inserting one of the plurality of said second nodes in said second node link tree if one of the plurality of said second nodes is authentic and is not already in said second node link tree.	the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
20. A wireless system comprising: a first node implementing a first node process including receiving data packets via a first node wireless radio, sending data packets via said wireless radio, communicating with a network, and performing node link tree housekeeping functions; a plurality of second nodes, each second node implementing a second node process including sending and receiving data packet via a second node wireless radio, maintaining a send/receive data buffer in a digital memory, and	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
selecting a link to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
the first node process further comprises maintaining a second node link tree having second node link entries, dynamically updating the tree to reflect the current operational status of the nodes, and rerouting data packets around inactive or malfunctioning nodes.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
21. A wireless system as recited in claim 20, wherein the first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
logic dynamically updating said second node link tree when said comparison meets predetermined conditions.	"The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable

The '471 Patent – Claims	Leiner Reference
	approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13.

The '471 Patent – Claims	Leiner Reference
	"One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
22. A wireless system as recited in claim 21, wherein the first node process further includes: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; logic deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is already in said second node link tree; and logic inserting one of the plurality of said second nodes in said second node link tree if said second node is authentic.	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
31. A wireless system comprising: a first node implementing a first node process including receiving data packets via a first node wireless radio, sending data packets via said wireless radio, and communicating with a network; a plurality of second nodes, each second node implementing a second node process including sending and receiving data packet via a second node wireless radio, maintaining a send/receive data buffer in a digital memory, and	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
selecting a link to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12.

The '471 Patent – Claims	Leiner Reference
	"One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
the first node process further comprises maintaining a second node link tree having second node link entries.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
32. A wireless system as recited in claim 31, wherein the first node process further comprises: logic comparing a selected link from one of the plurality of said second	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
nodes to said first node to a current second node link entry in said second node link tree; and logic updating said second node link tree when said comparison meets predetermined conditions.	must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved

The '471 Patent – Claims	Leiner Reference
	by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The

The '471 Patent – Claims	Leiner Reference
	centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a

The '471 Patent – Claims	Leiner Reference
	slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
33. A wireless system as recited in claim 32, wherein the first node process further includes: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; logic deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is already in said second node link tree; and logic inserting one of the plurality of said second nodes in said second node link tree if said second node is authentic.	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
34. A method for providing wireless network communication comprising: providing a first node implementing a first node process including receiving data packets via R.F. transmission and sending data packets via R.F. transmission; providing a plurality of second nodes, each second node providing a second node process including sending and receiving data packet via R.F. transmission, maintaining a send/receive data buffer in digital	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
memory, and	"1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
selecting a transmission path to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try

The '471 Patent – Claims	Leiner Reference
the remainder of said plurality of second nodes; and	harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
maintaining a second node link tree having second node link entries at the first node.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
35. A method as recited in claim 34, wherein said first node process	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
further includes: comparing a selected link from one of the plurality of said second nodes to said first node to a second node link entry in said second node link tree; and updating said second node link tree when said comparison meets at least one of several predetermined conditions.	collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	"Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
36. A method as recited in claim 34, wherein said first node process further includes: determining if one of the plurality of said second nodes is authentic; deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is already in said second node link tree; and inserting one of the plurality of said second nodes in said second node tree if said second node is authentic.	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
40. In a network including a plurality of client nodes having a client radio modem and a client controller which implements a client process including receiving and transmitting data packets via said client node to other nodes in the network, a server node comprising: a server node radio modem; and a server node controller	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
implementing a server process, said server process configured to:	performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
receive selected transmission paths	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two

The '471 Patent – Claims	Leiner Reference
from each of the plurality of client nodes, wherein said transmission path is one of a direct link to the server node and an indirect link to said server node through at least one other client node; determine an optimized transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes; and send the optimized transmission path for each of the plurality of client nodes to the respective client node.	packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In

The '471 Patent – Claims	Leiner Reference
	relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit

The '471 Patent – Claims	Leiner Reference
	not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '471 Patent – Claims	Leiner Reference
	"Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
41. The server node of claim 40, wherein the server process is further configured to perform gateway functions.	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an

The '471 Patent – Claims	Leiner Reference
	additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

Invalidity Chart for U.S. Patent No. 8,625,496

The '496 Patent – Claims	Leiner Reference
1. A wireless network system comprising: a server including a server controller and a server radio modem, said server controller implementing a server process that includes the control of said server radio modem, said server process including the receipt and transmission of data packets via said server radio modem; a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes the control of said client radio modem, said client process including the receipt and transmission of data packets via said client radio modem,	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue

The '496 Patent – Claims	Leiner Reference
	arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients; and	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20]. If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	information." Leiner at 13-14.
wherein the server process is configured to: receive information identifying the selected transmission path from each of the plurality of clients; determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients; send information identifying the server selected transmission path for each of the clients to the respective clients; and maintain a client link tree having client link entries representing each of the plurality of clients.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the

The '496 Patent – Claims	Leiner Reference
	correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13.

The '496 Patent – Claims	Leiner Reference
	"Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
2. A wireless network system comprising: a server including a server controller and a server radio modem, said server controller implementing a server process that includes the control of said server radio modem, said server process including the receipt and transmission of data packets via said server radio modem; and a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes the control of said client radio modem, said client process including the receipt and transmission	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to

The '496 Patent – Claims	Leiner Reference
of data packets via said client radio modem,	which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	"One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
wherein said server process further includes logic that maintains a client link tree having client link entries representing each of the plurality of clients, and wherein the server process is configured to: receive information identifying the selected transmission path from each of the plurality of clients, determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, and send information identifying the server selected transmission path for each of the clients to the respective	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.

The '496 Patent – Claims	Leiner Reference
clients.	
3. A wireless network system as recited in claim 2, wherein said server process is further configured to: compare a selected link from said client to said server to a current client link entry in said client link tree; and update said client link tree when said comparison meets predetermined conditions.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13.

The '496 Patent – Claims	Leiner Reference
	"Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
4. A wireless network system as recited in claim 2, wherein said server process is further configured to: determine if said client is authentic; determine if said client is already in said client link tree if said client is determined to be authentic; delete said client from said client link tree if said client is authentic and is already in said client link tree; and insert said client in said client link tree if said client is authentic and is not already in said client link tree.	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
5. The wireless network system of claim 2, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the

The '496 Patent – Claims	Leiner Reference
	existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most

The '496 Patent – Claims	Leiner Reference
	dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be

The '496 Patent – Claims	Leiner Reference
	applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
7. A wireless network system comprising: a server providing a server process including receiving data packets via a server wireless communication, sending data packets via said wireless communication, communicating with a network, and performing housekeeping functions; and a plurality of clients, each client providing a client process including sending and receiving data packet via a client wireless communication, maintaining a send/receive data buffer in digital memory, and	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways

The '496 Patent – Claims	Leiner Reference
	play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20]. If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information

The '496 Patent – Claims	Leiner Reference
	explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
wherein said server process further comprises maintaining a client link tree having client link entries representing each of the plurality of clients, and wherein the server process is configured to:	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
receive information identifying the selected transmission path from each of the plurality of clients, determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the server selected transmission path, and send information identifying the server selected transmission path for each of the clients to the respective clients.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control

The '496 Patent – Claims	Leiner Reference
	information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being

The '496 Patent – Claims	Leiner Reference
	used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
8. A wireless network system as recited in claim 7, wherein said server process is further configured to: compare a selected link from said client to said server to a current client link entry in said client link tree; and	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the

The '496 Patent – Claims	Leiner Reference
update said client link tree when said comparison meets predetermined conditions.	existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most

The '496 Patent – Claims	Leiner Reference
	dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for

The '496 Patent – Claims	Leiner Reference
	load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
9. A wireless network system as recited in claim 7, wherein said server process is further configured to: determine if said client is authentic; determine if said client is already in said client link tree if client is determined to be authentic; delete said client from said client link tree if said client is authentic and is already in said client link tree; and insert said client in said client link tree if said client is authentic and is not already in said client link tree.	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED,

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
10. The wireless network system of claim 7, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network

The '496 Patent – Claims	Leiner Reference
	connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may

The '496 Patent – Claims	Leiner Reference
	route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
11. A method for providing wireless network communication comprising: utilizing a server implementing a server process including receiving data packets via RF transmission,	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
sending data packets via RF transmission, communicating with a network, and performing housekeeping functions; and utilizing a plurality of clients, each client providing a client process including sending and receiving data packet via RF transmission, maintaining a send/receive data buffer in digital memory, and	destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22], Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means

The '496 Patent – Claims	Leiner Reference
	to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
wherein the server process: receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision

The '496 Patent – Claims	Leiner Reference
transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, sends information identifying the server selected transmission path for each of the clients to the respective clients; and	must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved

The '496 Patent – Claims	Leiner Reference
	by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
maintains a client link tree having client link entries representing each of the plurality of clients.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
12. A method for providing wireless network communication comprising: utilizing a server implementing a server process including receiving data packets via RF transmission, sending data packets via RF transmission, communicating with a network, and performing housekeeping functions; and utilizing a plurality of clients, each client providing a client process including sending and receiving data packet via RF transmission, maintaining a send/receive data	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
buffer in digital memory, and	"1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
wherein said server process further includes maintaining a client link tree having client link entries representing each of the plurality of clients, and wherein the server process:	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as

The '496 Patent – Claims	Leiner Reference
transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the server selected transmission path, and sends information identifying the server selected transmission path for each of the clients to the respective clients.	exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks,

The '496 Patent – Claims	Leiner Reference
	where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated

The '496 Patent – Claims	Leiner Reference
	with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
13. A method as recited in claim 12, wherein said server process further includes: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and

The '496 Patent – Claims	Leiner Reference
	forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
14. A method as recited m claim 12, wherein said server process further includes: determining is said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is authentic and is already in said client link tree; and inserting said client in said client link tree if said client is authentic and is not already in said client link tree.	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
15. The method of claim 12, wherein the client link entries correspond to the server selected transmission path	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be

The '496 Patent – Claims	Leiner Reference
between the server and the respective client.	determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be

The '496 Patent – Claims	Leiner Reference
	modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and

The '496 Patent – Claims	Leiner Reference
	congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are

The '496 Patent – Claims	Leiner Reference
	hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
16. A method for providing wireless network communication comprising the steps of: a server process including a data packet reception step, a data packet transmission step, a network communication step, and a housekeeping step; and a plurality of clients each providing a client process including a data sending and receiving step, a send and receive data buffer maintenance step, and	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways,

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22], Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
a transmission path selection step wherein the transmission path is one of a direct link to a server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20]. If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire

The '496 Patent – Claims	Leiner Reference
	route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
wherein the server process: receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, sends information identifying the server selected transmission path for each of the clients to the respective clients; and	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at

The '496 Patent – Claims	Leiner Reference
	each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location,

The '496 Patent – Claims	Leiner Reference
	routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
maintains a client link tree having client link entries representing each of the plurality of clients.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
17. A method for providing wireless network communication comprising the steps of:	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
a server process including a data packet reception step, a data packet transmission step, a network communication step, and a housekeeping step; and a plurality of clients each providing a client process including a data sending and receiving step, a send and receive data buffer maintenance step, and	radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22], Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
a link selection step wherein the transmission path is one of a direct link to a server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
wherein said server process further comprises the step of maintaining a client link tree having client link	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
entries representing each of the plurality of clients, and	determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
wherein the server process: receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the server selected transmission path, and sends information identifying the server selected transmission path for each of the clients to the respective clients.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that

The '496 Patent – Claims	Leiner Reference
	occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has

The '496 Patent – Claims	Leiner Reference
	each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact,

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
18. A method as recited m claim 17, wherein said server process further comprises the steps of: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12.

The '496 Patent – Claims	Leiner Reference
	"Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method

The '496 Patent – Claims	Leiner Reference
	(with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example,

The '496 Patent – Claims	Leiner Reference
	based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
19. A method as recited in claim 17, wherein said server process further comprises steps of:	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
determining if said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is authentic and is already in said client link tree; and inserting said client into said client link tree if said client is authentic and is not already in said client link tree.	the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from

The '496 Patent – Claims	Leiner Reference
	the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
20. The method of claim 17, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination

The '496 Patent – Claims	Leiner Reference
	pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was

The '496 Patent – Claims	Leiner Reference
	the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	"This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
21. A wireless network system comprising: a first node including a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling of said first node radio modem, said first node process including receiving and transmitting data packets via said first node radio modem;	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition,

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
a plurality of second nodes each including a second node controller implementing a second node process that includes controlling a second node radio modem, said second node process including receiving and transmitting data packets via said second node radio modem,	as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
wherein said second node process of each of said second nodes includes	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
initiating a radio transmission path to said first node that is a link to said first node through at least one of the remainder of said plurality of second nodes,	level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
wherein said first node process dynamically updates a second node link tree comprising second node link entries representing each of the plurality of second nodes and dynamically modifies the second node link tree so that the data packet transmission path to the first node is optimized.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is

The '496 Patent – Claims	Leiner Reference
	the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE

The '496 Patent – Claims	Leiner Reference
	PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
22. A wireless network system as recited in claim 21, wherein at least	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
one of the second nodes is a mobile device and said first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and logic dynamically updating said second node link tree when said comparison meets predetermined conditions.	collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This

The '496 Patent – Claims	Leiner Reference
	can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	"Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
23. A wireless network system as recited in claim 21, wherein said first node process further comprises: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; and logic inserting one of the plurality of said second nodes in said second node link tree if one of the plurality of said second nodes is authentic and is not already in said second node link tree.	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
24. In a wireless system comprising a plurality of second nodes, each second node implementing a second node process including sending and receiving data packet via a second node wireless radio, maintaining a send/receive data buffer in a digital memory, and	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
selecting a link to a first node that is	"In the section above on data link control, the tradeoff between the various link

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes,	parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20]. If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
a first node configured to implement a first node process, the first node process including: receiving data packets via a first node wireless radio; sending data packets via said wireless radio; communicating with a network; performing node link tree housekeeping functions;	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for

The '496 Patent – Claims	Leiner Reference
	performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
maintaining a second node link tree	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two

The '496 Patent – Claims	Leiner Reference
having second node link entries representing each of the plurality of second nodes;	packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
dynamically updating the tree to reflect the current operational status of the second nodes; and rerouting data packets around inactive or malfunctioning second nodes.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point

The '496 Patent – Claims	Leiner Reference
	routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not

The '496 Patent – Claims	Leiner Reference
	needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.

The '496 Patent – Claims	Leiner Reference
	"This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
25. The first node of claim 24, wherein the first node process further includes: comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and dynamically updating said second node link tree when said comparison	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic

The '496 Patent – Claims	Leiner Reference
meets predetermined conditions.	tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13.

The '496 Patent – Claims	Leiner Reference
	"HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to

The '496 Patent – Claims	Leiner Reference
	each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
26. The first node of claim 24, wherein	"2) Network Access-Methods and Administration: Network access means the

The '496 Patent – Claims	Leiner Reference
the first node process further includes: determining if one of the plurality of said second nodes is authentic; determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is authentic and is already in said second node link tree; and inserting one of the plurality of said second nodes in said second node link tree if said second node is authentic and is not already in said client link tree.	functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
27. In a wireless system comprising a plurality of second nodes and a first node configured to implement a first node process, the first node process including receiving data packets via a first node wireless radio, sending data packets via said wireless radio, communicating with a network, performing node link tree housekeeping functions,	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
maintaining a second node link tree having second node link entries representing each of the plurality of second nodes,	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.

The '496 Patent – Claims	**Leiner Reference**
dynamically updating the tree to reflect the current operational status of the second nodes, and rerouting data packets around inactive or malfunctioning second nodes, a second node in the plurality of second nodes,	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13.

The '496 Patent – Claims	**Leiner Reference**
	"Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	"Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet

The '496 Patent – Claims	Leiner Reference
	or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
the second node configured to implement a second node process including: sending and receiving data packet via a second node wireless radio; maintaining a send/receive data buffer in a digital memory; and	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
selecting a link to the first node that is one of a direct link to the first node and an indirect link to the first node through at least one of the remainder of the plurality of second nodes.	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and

The '496 Patent – Claims	Leiner Reference
	then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
33. In a wireless network system comprising a plurality of second nodes each including a second node controller configured to implement a second node process that includes controlling a second node radio modem, receiving and transmitting data packets via said second node radio modem, and	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
initiating a radio transmission path to a first node that is a direct link to said first node through at least one of the remainder of said plurality of second nodes,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
the first node comprising: a first node controller; and a first node radio modem, wherein said first node controller is configured to implement a first node process comprising: controlling said first node radio modem; receiving and transmitting data packets via said first node radio modem; and	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
maintaining a second node link tree comprising second node link entries representing each of the plurality of second nodes.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.

The '496 Patent – Claims	Leiner Reference
34. A wireless network system as recited in claim 33, wherein said first node process further comprises: comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and updating said second node link tree when said comparison meet predetermined conditions.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13.

The '496 Patent – Claims	Leiner Reference
	"Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
35. A wireless network system as recited in claim 33, wherein said first node process further comprises: determining if one of the plurality of said second nodes is authentic; determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; and inserting one of the plurality of said second nodes in said second node link tree if one of the plurality of said second nodes is authentic and is not already in said client link tree.	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts

The '496 Patent – Claims	Leiner Reference
	are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
36. In a wireless network system comprising a plurality of second nodes and a first node, the first node comprising a first node controller and a first node radio modem, wherein said first node controller is	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6.

The '496 Patent – Claims	Leiner Reference
configured to implement a first node process that includes controlling said first node radio modem, receiving and transmitting data packets via said first node radio modem, and	"Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while

The '496 Patent – Claims	Leiner Reference
	somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
maintaining a second node link tree comprising second node link entries representing each of the plurality of second nodes, at least one second node in the plurality of second nodes comprising:	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
a second node controller configured to implement a second node process that includes controlling a second node radio modem, receiving and transmitting data packets via said second node radio modem,	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is

The '496 Patent – Claims	Leiner Reference
	concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
initiating a radio transmission path to a first node that is a direct link to said first node through at least one of the remainder of said plurality of second nodes.	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
37. A method for providing wireless network communication comprising: implementing in a first node a first node process including receiving data packets via R.F. transmission and sending data packets via R.F. transmission; implementing in each of a plurality of second nodes a second node process including sending and receiving data packet via R.F. transmission, maintaining a send/receive data buffer in digital memory, and	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	"1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
selecting a transmission path to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20). If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should

The '496 Patent – Claims	Leiner Reference
second nodes; and	attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
maintaining a second node link tree having second node link entries representing each of the plurality of second nodes at the first node.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
38. A method as recited in claim 37, wherein said first node process further includes:	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be

The '496 Patent – Claims	Leiner Reference
comparing a selected link from one of the plurality of said second nodes to said first node to a second node link entry in said second node link tree; and updating said second node link tree when said comparison meets at least one of several predetermined conditions.	determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be

The '496 Patent – Claims	Leiner Reference
	modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and

The '496 Patent – Claims	Leiner Reference
	congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are

The '496 Patent – Claims	Leiner Reference
	hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
39. A method as recited in claim 37, wherein said first node process further includes: determining if one of the plurality of said second nodes is authentic; deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is authentic and is already in said second node link tree; and inserting one of the plurality of said second nodes in said second node tree if said second node is authentic and is not already in said client link tree.	"2) Network Access-Methods and Administration: Network access means the functional entry of a network by a person or device capable of using resources within the network or its attached devices. As a general rule it is prudent, depending upon the threat, to exercise access control at the periphery of the network rather than at some centralized (or interior) point or points. Exercising access control at some internal point means that the network must offer a petitioner transport to that point without knowledge as to whether he is entitled to entry or not. Packet radio with mobile nodes means that access can occur virtually any place within the topology. If so, how can access control best work? Most packet networks provide access through either a connected host or directly through a network-based device (such as a dial-up port). The combination is very convenient, principally for the traveling user who might find it difficult to gain access to a host when not in his normal area. Earlier conventions, wherein network access was not critically controlled and control of host access was invoked at the host only, led to considerable vulnerability to both the network and the attached hosts. Because of the wide host accessibility once network access had been gained, network-based access points have characteristically been a weak point in protecting networks from unwanted host entry. Network log-on hosts are increasingly the rule where network-based access is afforded and they may be practical depending on how close to the actual point of network entry access gets controlled. In mobile packet radio network entry can occur at any node. Mobile users may request entry (connection service) at different places at different times or different places at the same time. Obviously, it becomes more difficult to distribute

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	the access authorization in this situation than if entry were at a fixed location. If access control is decentralized, all nodes may require all authorizations for all mobile users at all times. Thus the issue is HOW SHOULD ACCESS BE CONTROLLED, AT NETWORK ENTRY OR AT SOME MORE CENTRALIZED POINT? A distributed access control system has some problems of concurrency but minimizes resource utilization in the access process. A centralized one suffers from single-point vulnerability and needs to have some means to prevent someone from tying up the network with access requests. While the above deals only with single network access it is assumed that access from the internet is also possible. Gateways may then hold the same access role as the collection of hosts, depending on how important access control to the network itself is viewed." Leiner at 17-18. It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
40. In a network including a plurality of client nodes having a client radio modem and a client controller which implements a client process including receiving and transmitting data packets via said client node to other nodes in the network, a server node comprising: a server node radio modem; and a server node controller implementing a server process, said server process	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition,

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
configured to:	as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22], Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
receive information identifying selected transmission paths from each	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be

The '496 Patent – Claims	Leiner Reference
of the plurality of client nodes, wherein said transmission path is one of a direct link to the server node and an indirect link to said server node through at least one other client node; determine a server selected transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes; send information identifying the server selected transmission path for each of the plurality of client nodes to the respective client node; and	collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their

The '496 Patent – Claims	Leiner Reference
	connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This

The '496 Patent – Claims	Leiner Reference
	can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14.

The '496 Patent – Claims	Leiner Reference
	"Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
maintain a client link tree having client link entries representing each of the plurality of client nodes.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
41. The server node of claim 40, wherein the server process is further configured to perform gateway functions.	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition,

The '496 Patent – Claims	Leiner Reference
	as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
42. A server for use in a wireless	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists

The '496 Patent – Claims	Leiner Reference
network system including a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes controlling said client radio modem, receiving and transmitting data packets via said client radio modem,	of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20]. If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
said server comprising:	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists

The '496 Patent – Claims	Leiner Reference
a server controller and a server radio modem, said server controller implementing a server process that includes the controlling of said server radio modem, receiving and transmitting of data packets via said server radio modem,	of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22), Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single

The '496 Patent – Claims	Leiner Reference
	network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
maintaining a client link tree having client link entries representing each of the plurality of clients, and	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11.
receiving information identifying the selected transmission path from each of the plurality of clients, determining a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, and sending information identifying the server selected transmission path for	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic

The '496 Patent – Claims	Leiner Reference
each of the clients to the respective clients.	tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13.

The '496 Patent – Claims	Leiner Reference
	"HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
44. The server of claim 42, wherein	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two

The '496 Patent – Claims	Leiner Reference
the client link entries correspond to the server selected transmission path between the server and the respective client.	packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In

The '496 Patent – Claims	Leiner Reference
	relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit

The '496 Patent – Claims	Leiner Reference
	not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14.

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	"Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.
45. A first node for use in wireless network system including a plurality of second nodes each including a second node controller implementing a second node process that includes controlling a second node radio modem, receiving and transmitting data packets via said second node radio modem,	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22], Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
wherein said second node process of each of said second nodes includes initiating a radio transmission path to said first node that is a link to said first node through at least one of the remainder of said plurality of second nodes,	"In the section above on data link control, the tradeoff between the various link parameters was discussed. In addition, there must be an interaction between network level routing algorithms (discussed below) and the control of the link parameters [20]. If link connectivity is lost, the network must determine whether it should try harder on that link (by, for example, increasing power or coding gain) or it should attempt to find a different route, thereby possibly suffering some delay and lost packets while the new route is determined." Leiner at 12. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and then take action locally that is commensurate with that global optimum. For example,

The '496 Patent – Claims	Leiner Reference
	based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14.
said first node comprising: a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling said first node radio modem, receiving and transmitting data packets via said first node radio modem, and	"Fig. 1 shows a typical packet radio network structure [8]. A packet radio unit consists of a radio, antenna, and digital controller. The radio provides connectivity to a number of neighboring radios, but typically is not in direct connectivity with all radios in the network. Thus the controller needs to provide for store-and-forward operation, relaying packets to accomplish connectivity between the originating and destination users." Leiner at 6. "Thus there are many design choices that must be made in the development of a packet radio network. There is usually no single correct choice, and the decisions are dependent on the environment that the network must work in, the requirements for performance and other functionalities, and the cost and other limitations. In addition, as new hardware and software technologies become available, the parameters governing the decisions change and often result in different selections." Leiner at 7. "1) Gateways: Gateways can perform many functions but, as far as addressing is concerned, they are packet translation devices that interpret addresses at the internet level and impose headers (addresses) appropriate both to the local networks to which they are attached as well as other networks. They are host-level devices and to work correctly must have some relationship with not only the other gateways of the internet but the network-attached hosts themselves. Gateways may have an

The '496 Patent – Claims	Leiner Reference
	additional role in highly mobile networks such as packet radio where topological partitioning may occur dynamically. Under these circumstances, the gateways, normally internet devices, may take on a role of intranetwork addressing and routing. Specifically, the internet may become the trajectory over which an intranet packet gets delivered when a single network temporarily divides [22], Whenever gateways play important roles such as this in mobile packet radio networks, the following issue arises: SHOULD ADDRESSING AND ROUTING BE NETWORK- OR GATEWAY-BASED? Network-based addressing means that each network has a unique name and address of which all relevant gateways are aware. In this case, all points within a single network share some portion of their address in common. In contrast, if gateway-based addressing is used, then internet packets are routed from gateway to gateway and each gateway attached to a network must have some means to route packets to destinations within that network. Furthermore, in this case, hosts must have a means to bind themselves dynamically to at least one gateway. Gateway-based routing, while somewhat less intuitive, provides a solution to the problem of what to do when a single network becomes partitioned." Leiner at 17.
dynamically updating a second node link tree comprising second node link entries representing each of the plurality of second nodes so that the data packet transmission path to the first node is optimized.	"Radio connectivity must be determined by the two ends of the radio link (i.e., the two packet radio units which are connected). The information from each node can be collected at a central location where connectivity is then determined, or it can be determined by the nodes themselves through a cooperative mechanism, such as exchange of the number of transmitted and received packets. In either case, a decision must be made as to the nature of the information that will be used to determine the existence of a link." Leiner at 11. "The basic job of the network management algorithms is to allow data packets to be routed through the network in an efficient and reliable manner. This entails two basic tasks. The first is the establishment of routes through the network, and the second is

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	the forwarding of packets along those routes." Leiner at 12. "Because flooding techniques do not require *a priori* knowledge of the network connectivity, they are easily used for disseminating network management and control information which is used to determine that connectivity." Leiner at 13. "Point-to-point routing methods typically involve the association of a route (a sequence of links) with a source-destination pair. One method of doing point-to-point routing is to explicitly associate information in each node with a source- destination pair (connection). Typically such techniques involve a route establishment phase that occurs when the 'connection' is first recognized, and then the information stored at each node is used to perform the actual routing of the packets. Forwarding of packets then simply involves looking up the appropriate forwarding information based on the connection identifier (which is carried in the packet). If topology changes occur, a new route establishment (or re-establishment) phase would occur to assure that the correct information is stored at all the nodes in the intended route." Leiner at 13. "Thus we see that all three routing methods have a place in packet radio networks. In relatively static networks, it is often most efficient to have the nodes determine their connectivity, and then determine relatively fixed routes (which would then be modified if connectivity changed due to mobility, etc.). For more dynamic networks, where connectivity is constantly changing, higher channel efficiency can be achieved by reducing the connection setups and the associated overhead. Finally, in the most dynamic networks, where network delays preclude tracking of connectivity on any but the most local basis, flooding techniques would appear to be a reasonable approach." Leiner at 13. "HOW SHOULD THE INFORMATION THAT EACH NODE REQUIRES TO ROUTE

The '496 Patent – Claims	Leiner Reference
	PACKETS BE DISSEMINATED TO THOSE NODES? For any type of routing method (with the exception of the most simple flooding methods), the local connectivity information must be processed and made available to the nodes so that they may route the packets. Note that this is somewhat independent of the type of routing being used. However, it does depend on the method for determining link connectivity and in particular, where the resulting connectivity information resides. A popular method for doing routing in networks where functional distribution is not needed (e.g., for survivability) is to use a centralized routing server. (This, in fact, was the method used in the early DARPA packet radio network [3].) This technique has each node send its local connectivity information to a central location. At this location, routes are determined and the information required by each node to process and forward packets (such as the next node along the route) is sent to the individual network nodes on either a request basis or as a background operation which constantly updates tables in the nodes." Leiner at 13. "Use of a centralized routing server has several advantages over more distributed techniques. Because the server has all the connectivity information available (albeit not necessarily current), it can be quite efficient in the computation of routes. This can be a significant advantage in packet radio situations where both connectivity and congestion are more visible globally and where some nodes are typically collocated with mobile users as opposed to being located in some predetermined location. The centralized techniques can generally be extended to a small number of servers for load-sharing and/or backup, thus overcoming some of the problems of size and robustness inherent in a centralized method." Leiner at 13. "One method for distributing the routing process is to provide enough information to each node so that each node can simply compute for itself the best total route and

Exhibit B11 – Invalidity Chart for Brownrigg Family based on Leiner Reference

The '496 Patent – Claims	Leiner Reference
	then take action locally that is commensurate with that global optimum. For example, based on the computed best total route, a node may determine which is the best node to forward the packet. At the next node, the route may be recomputed or the entire route (or portion) could be included in the packet. (The latter is considerably less robust in the face of changing topology.) This form of distributed routing can be accomplished by having each node transmit its local connectivity information explicitly to every other node. Typically a form of flooding is used to disseminate the information." Leiner at 13-14. "This method is quite robust (except for errors in tables or transmissions) and, in fact, is the (new) algorithm used in the Arpanet [21] and is planned for use in the gateways of the DARPA Internet system [22], [23]. However, if the network has a relatively high rate of topology changes, the amount of traffic on the network could be very high, as every substantial topology change can produce a number of packets roughly equal to the number of nodes in the network times the number of nodes directly affected by the change. Thus this method of routing is well-suited to a network like the Arpanet or a packet radio network consisting of fixed locations where topology changes are infrequent." Leiner at 14. "Another interesting routing structure occurs when packet radio networks are hierarchically organized. If the network is assumed to consist of clusters of packet radios that are interconnected, the topology between clusters is likely to change at a slower rate than that between radios, and therefore hierarchical techniques may be applicable. We see this applied to packet radio in [24] and [6]." Leiner at 14.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The Geier reference, Geier, DeSimio, and Welsh, "Network Routing Techniques and Their Relevance to Packet Radio Networks," ARRL/CRRL Amateur Radio 9th Computer Networking Conference, pages 105-117 (1990) (Geier), includes descriptions relating to network routing techniques.

Invalidity Chart for U.S. Patent No. 6,249,516

The '516 Patent – Claims	Geier Reference
1. A server providing a gateway between two networks, where at least one of the two networks is a wireless network, said server comprising: a radio modem capable of communicating with a first network that operates, at least in part, by wireless communication; a network interface capable of communicating with a second network; and a digital controller coupled to said radio modem and to said network interface, said digital controller communicating with said first network via said radio modem and communicating with said second network via said network interface, said digital controller passing data packets received from said first	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at

The '516 Patent – Claims	Geier Reference
network that are destined for said second network to said second network, and passing data packets received from said second network that are destined for said first network to said first network,	a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
said digital controller maintaining a map of data packet transmission paths of a plurality of clients of said first network, where a transmission path of a client of said first network to said server can be through one or more of other clients of said first network;	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '516 Patent – Claims	Geier Reference
	the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '516 Patent – Claims	Geier Reference
	transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '516 Patent – Claims	Geier Reference
	status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein said digital controller changes the transmission paths of clients to optimize the transmission paths including changing the transmission path from the client to the gateway so that the path to the gateway is chosen from the group consisting essentially of the path to the gateway through the least possible number of additional clients, the path to the gateway through the most	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information,

The '516 Patent – Claims	Geier Reference
robust additional clients, the path to the gateway through the clients with the least amount of traffic, and the path to the gateway through the fastest clients.	node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '516 Patent – Claims	Geier Reference
	and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is

The '516 Patent – Claims	Geier Reference
	operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
2. A server as recited in claim 1, wherein the second network is a TCP/IP protocol network.	Nodes having a gateway functions to a point-to-point network, such as the internet, would inherently involve the TCP/IP protocol. At a minimum, it would have been obvious to use TCP/IP in a point-to-point protocol network in order to provide a well-known and reliable protocol. See V. G. Cerf and R. E. Kahn, "A protocol for packet

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '516 Patent – Claims	Geier Reference
	network intercommunications," IEEE Trans. Commun., vol. COM-22, pp. 637-648 (May 1974); V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
4. A server as recited in claim 1, wherein the digital controller translates data packets received from the second network and destined for the first network into a format used by the first network, and the digital controller translates data packets received from the first network and destined for the second network into a format used by the second network.	It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
5. A server as recited in claim 2: wherein the digital controller receives data packets from the TCP/IP protocol network destined for a client of the first network, adds a header that includes an address of the client of the first network and a data transmission path to the client of the first network, adds a indicator of the type of data associated with the packet, and transmits the packet via the radio	It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978). It also would have been obvious to include a packet type to packets received by the gateway in order to provide separate processing of different kinds of packets. Such could ensure adequate quality of service for the data packet and more reliable handling of data packets of different types, which were well-known to a person of

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '516 Patent – Claims	Geier Reference
modem with the header and the indicator; and wherein the digital controller receives data packets from the first network destined for the TCP/IP protocol network, converts the data packets into TCP/IP format, and sends the TCP/IP format data packet to an IP address on the TCP/IP protocol network.	ordinary skill.
10. A method providing a gateway between a wireless network and a second network comprising: receiving a data packet from a client of said wireless network, converting said data packet to a proper format for said second network, and sending said data packet to said second network; and receiving a data packet from said second network, adding a header to said packet including a reverse link and a data packet type if said data packet is destined for a client of said wireless network, said reverse link being one of a direct link to said client and an indirect link to said client	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '516 Patent – Claims	Geier Reference
through one or more other clients of said network, and transmitting said data packet with said header; and	controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
changing transmission paths of clients to optimize the transmission paths including changing the transmission path from the client to the gateway so that the path to the gateway is chosen from the group consisting essentially of the path to the gateway through the least possible number of additional clients, the path to the gateway through the most robust additional clients, the path to the gateway through the clients with the least amount of traffic, and the path to the gateway through the fastest clients.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay

The '516 Patent – Claims	Geier Reference
	to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107.

The '516 Patent – Claims	Geier Reference
	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate

The '516 Patent – Claims	Geier Reference
	direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
11. A method as recited in claim 10: wherein the second network is a TCP/IP protocol network; wherein the data packet received from a client of a wireless network is converted to a TCP/IP format if it is destined for an IP address on a	It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '516 Patent – Claims	Geier Reference
TCP/IP protocol network, and the TCP/IP format data packet is sent to the IP address on the TCP/IP protocol network; and wherein the data packet received from the second network is received from the TCP/IP protocol network.	It also would have been obvious to include a packet type to packets received by the gateway in order to provide separate processing of different kinds of packets. Such could ensure adequate quality of service for the data packet and more reliable handling of data packets of different types, which were well-known to a person of ordinary skill.
13. A method as recited in claim 10 further comprising maintaining a map of data packet transmission paths of a plurality of clients of the wireless network, where a transmission path of a client of the wireless network to the server can be through one or more other clients of the first network.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually

The '516 Patent – Claims	Geier Reference
	have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count,

The '516 Patent – Claims	Geier Reference
	and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done,

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '516 Patent – Claims	Geier Reference
	continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
14. A method as recited in claim 13, further comprising dynamically updating the map of data packet transmission paths to optimize the data packet transmission paths of the clients.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research

The '516 Patent – Claims	Geier Reference
	Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have

The '516 Patent – Claims	Geier Reference
	complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '516 Patent – Claims	Geier Reference
	and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

Invalidity Chart for U.S. Patent No. 8,000,314

The '314 Patent – Claims	Geier Reference
1. A wireless network system comprising: a first node including a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling said first node radio modem, said first node process including receiving and transmitting data packets via said first node radio modem; a plurality of second nodes each including a second node controller and a second node radio modem, said second node controller implementing a second node process that includes controlling of said second node radio modem, said second node process including receiving and transmitting data packets via said second node radio modem,	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in

The '314 Patent – Claims	Geier Reference
	the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
wherein said second node process of each of said second nodes includes selecting a radio transmission path to said first node that is direct or through at least one of the remainder of said plurality of second nodes; and	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	"Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	"On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the

The '314 Patent – Claims	Geier Reference
	table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein said selected path to said first node utilizes the least number of other second nodes, such that said transmission path from each of said second nodes to said first node is optimized and the first node controller implements changes to upgrade the selected transmission path in response to a request from at least one of said second nodes.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the

The '314 Patent – Claims	Geier Reference
	routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
4. A first node providing a gateway between a wireless network and a second network, the first node comprising: a first data packet receiver configured to receive a data packet from a second node of said wireless network, a first converter configured to convert the data packet to a format used in said second network, and a data packet sender configured to send the data	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
packet to a proper location on said second network; and a second data packet receiver configured to receive the data packet from said second network, a second converter configured to convert the data packet to a format used in said wireless network, and a data packet sender configured to send said data packet with a header to a second node of said wireless network; and	operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
a controller configured to implement changes to a transmission path from the second node to the first node based upon viable network paths observed by the second node so that the path to the first node is chosen from the group consisting essentially of the path to first node through the	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through

The '314 Patent – Claims	Geier Reference
least possible number of additional second nodes, the path to the first node through the most robust additional second nodes, the path to the first node through the second nodes with the least amount of traffic, and the path to the first node through the fastest second nodes.	the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	"The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or

The '314 Patent – Claims	Geier Reference
	near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
10. A client node in a network	"With packet radio networks, the distance between source and destinat.ion nodes

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
including a server node having a server radio modem and a server controller which implements a server process that includes controlling the server node to receive and transmit data packets via said server node to other nodes in the network, the client node comprising: a client node radio modem; and a client node controller; said client node controller implementing a process including receiving and transmitting data packets via said client modem;	typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network

The '314 Patent – Claims	Geier Reference
	interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
selecting a radio transmission path to said server node that is one of a direct link to said server node and an indirect link to said server node through at least one other client node;	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away

The '314 Patent – Claims	Geier Reference
	(tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through

The '314 Patent – Claims	Geier Reference
	particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
implementing a process requesting updated radio transmission path data from said server node, and in response thereto, implementing by the server node changes to upgrade the selected transmission path to an optimized transmission path.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count,

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done,

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
12. A first node providing a gateway between two networks, where at least one of the two networks is a wireless network, said first node comprising: a radio modem capable of communicating with a first network that operates in part, by wireless communication; a network interface to communicating with a second network; a digital controller coupled to said radio modem and to said network interface, said digital controller	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both."

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
communicating with said first network via said radio modem and communicating with said second network via said network interface, said digital controller passing data packets received from said first network that are destined for said second network to said second network, and passing data packets received from said second network that are destined for said first network to said first network,	Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
said digital controller maintaining a map of data packet transmission paths to a plurality of second nodes of said first network, where a transmission path of a second node of said first network to said first node can be through one or more of other second node of said first network;	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106.

The '314 Patent – Claims	Geier Reference
	"With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein said digital controller changes the transmission paths of each of the second nodes to optimize the transmission paths including	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105.

The '314 Patent – Claims	Geier Reference
changing each transmission path from on of the plurality of said second nodes to the first node so that the path to the first node is chosen from the group consisting essentially of the path to the first node through the least possible number of additional second nodes, the path to the first node through the most robust additional second nodes, the path to the first node through the second nodes with the least amount of traffic, and the path to the first node through the fastest second nodes.	"In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	This ensures other nodes get the updates as soon as possible." Geier at 113.
13. A first node as recited in claim 12, wherein the digital controller translates data packets received from the second network and destined for the first network into a format used by the first network, and the digital controller converts data packets received from the first network and destined for the second network into a format used by the second network.	It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
14. A first node providing a gateway between a wireless network and a second network, the first node comprising: a first data packet receiver implementing a process to receive a data packet from a second node of said wireless network, a first converter implementing a process to convert said data packet to a format used in said second network, and a first transmitter implementing a process to transmit said data packet to a proper location on said second	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
network; and a second data packet receiver implementing a process to receive a data packet from said second network, a second converter implementing a process to convert said data packet to a format used in said wireless network, and a second transmitter implementing a process to transmit said data packet with a header to a second node of said wireless network; and	"Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
a controller implementing a process to change a transmission path to optimize a transmission path includes changing the transmission path from the second node to the first node so that the path to the first node is chosen from the group consisting essentially of the path to the first node through the least possible number of additional second nodes, the path to the first node through the most robust	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information,

The '314 Patent – Claims	Geier Reference
additional second nodes, the path to the first node through the second nodes with the least amount of traffic, and the path to the first node through the fastest second nodes.	node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '314 Patent – Claims	Geier Reference
	operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.

Invalidity Chart for U.S. Patent No. 8,233,471

The '471 Patent – Claims	Geier Reference
2. A wireless network system comprising: a server including a server controller and a server radio modem, said server controller implementing a server process that includes the control of said server radio modem, said server process including the receipt and transmission of data packets via said server radio modem; and a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes the control of said client radio modem, said client process including the receipt and transmission of data packets via said client radio modem,	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106.

The '471 Patent – Claims	Geier Reference
	"Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	"On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the

The '471 Patent – Claims	Geier Reference
	table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein said server process further includes logic that maintains a client link tree having client link entries corresponding to an optimized transmission path for each of the plurality of clients, and	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information

The '471 Patent – Claims	Geier Reference
	as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein the server process is configured to: receive the selected transmission path from each of the plurality of clients, determine the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the optimized transmission path, and	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables.

The '471 Patent – Claims	Geier Reference
send the optimized transmission path for each of the clients to the respective clients.	Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the

The '471 Patent – Claims	Geier Reference
	information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
3. A wireless network system as recited in claim 2, wherein said server process further comprises: logic that compares a selected link from said client to said server to a	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count,

The '471 Patent – Claims	Geier Reference
current client link entry in said client link tree; and logic that updates said client link tree when said comparison meets predetermined conditions.	and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
4. A wireless network system as recited in claim 3, wherein said server process further comprises: logic that determines if said client is	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.

The '471 Patent – Claims	Geier Reference
authentic; logic that determines if said client is already in said client link tree if client is determined to be authentic; logic that deletes said client from said client link tree if said client is already in said client link tree; and logic that inserts said client in said client link tree if said client is authentic.	
6. A wireless network system comprising: a server providing a server process including: receiving data packets via a server wireless communication, sending data packets via said wireless communication, communicating with a network, and performing housekeeping functions; and a plurality of clients, each client providing a client process including sending and receiving data packet via a client wireless communication, maintaining a send/receive data buffer in digital memory, and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107.

The '471 Patent – Claims	Geier Reference
	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein said server process further comprises maintaining a client link tree having client link entries corresponding to an optimized transmission path for each of the plurality of clients, and	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through

The '471 Patent – Claims	Geier Reference
	the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07.

The '471 Patent – Claims	Geier Reference
	"The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or

The '471 Patent – Claims	Geier Reference
	near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein the server process is configured to:	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the

The '471 Patent – Claims	Geier Reference
receive the selected transmission path from each of the plurality of clients, determine the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the optimized transmission path, and send the optimized transmission path for each of the clients to the respective clients.	network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node

The '471 Patent – Claims	Geier Reference
	N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as

The '471 Patent – Claims	Geier Reference
	before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113.

The '471 Patent – Claims	Geier Reference
	"After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
7. A wireless network system as recited in claim 6, wherein said server process is further configured to: compare a selected link from said client to said server to a current client link entry in said client link tree; and update said client link tree when said comparison meets predetermined conditions.	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	"After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
8. A wireless network system as recited in claim 7, wherein said server process is further configured to: determine if said client is authentic; determine if said client is already in said client link tree if client is determined to be authentic; delete said client from said client link tree if said client is already in said client link tree; and insert said client in said client link tree if said client is authentic.	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
10. A method for providing wireless network communication comprising: providing a server implementing a server process including receiving data packets via RF transmission, sending data packets via RF transmission, communicating with a network, and performing housekeeping functions; and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the

The '471 Patent – Claims	Geier Reference
providing a plurality of clients, each client providing a client process including sending and receiving data packet via RF transmission, maintaining a send/receive data buffer in digital memory, and	next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the

The '471 Patent – Claims	Geier Reference
	nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar

The '471 Patent – Claims	Geier Reference
	to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
wherein the server process: receives the selected transmission path from each of the plurality of clients determines the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients updates the client link entries to provide the optimized transmission path, and sends the optimized transmission path for each of the clients to the respective clients.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head

The '471 Patent – Claims	Geier Reference
	off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	"If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide

The '471 Patent – Claims	Geier Reference
	just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
11. A method as recited in claim 10, wherein said server process further includes: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
12. A method as recited in claim 11, wherein said server process further includes: determining is said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is already in said client link tree; and inserting said client in said client link tree if said client is authentic.	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
14. A method for providing wireless network communication comprising the steps of: a server process including a data packet reception step, a data packet transmission step, a network communication step, and a	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
housekeeping step; and a plurality of clients each providing a client process including a data sending and receiving step, a send and receive data buffer maintenance step, and	"Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
a link selection step that is one of a direct link to a server and an indirect link to said server through at least one of the remainder of said plurality of	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
clients,	"In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In

The '471 Patent – Claims	Geier Reference
	addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet.

The '471 Patent – Claims	Geier Reference
	This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein said server process further comprises the step of maintaining a client link tree having client link entries corresponding to an optimized transmission path for each of the plurality of clients, and	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away

The '471 Patent – Claims	Geier Reference
	(tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein the server process: receives the selected transmission path from each of the plurality of clients, determines the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the optimized transmission path, and sends the optimized transmission path for each of the clients to the respective clients.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually

The '471 Patent – Claims	Geier Reference
	have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count,

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done,

The '471 Patent – Claims	Geier Reference
	continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
15. A method as recited in claim 14, wherein said server process further comprises the steps of: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
16. A method as recited in claim 15, wherein said server process further comprises steps of: determining if said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is already in said client link tree; and inserting said client into said client link tree if said client is authentic.	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
17. A wireless network system comprising: a first node including a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling of said first node radio modem, said first node process including receiving and transmitting data packets via said first node radio modem; a plurality of second nodes each including a second node controller implementing a second node process that includes controlling a second node radio modem, said second node process including receiving and transmitting data packets via said second node radio modem,	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
wherein said second node process of each of said second nodes includes initiating a radio transmission path to said first node that is a link to said first node through at least one of the remainder of said plurality of second nodes; and	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency)

The '471 Patent – Claims	Geier Reference
	packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108.

The '471 Patent – Claims	Geier Reference
	"On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein said first node process dynamically updates a second node link tree comprising second node link entries and dynamically modifies the second node link tree so that the data packet transmission from the first node is optimized.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information

The '471 Patent – Claims	Geier Reference
	as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before

The '471 Patent – Claims	Geier Reference
	retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the

The '471 Patent – Claims	Geier Reference
	routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
18. A wireless network system as recited in claim 17, wherein at least one of the second nodes is a mobile device and said first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and logic dynamically updating said	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a

The '471 Patent – Claims	Geier Reference
second node link tree when said comparison meets predetermined conditions.	status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
19. A wireless network system as recited in claim 18 wherein said first node process further comprises: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
nodes is determined to be authentic; and logic inserting one of the plurality of said second nodes in said second node link tree if one of the plurality of said second nodes is authentic and is not already in said second node link tree.	
20. A wireless system comprising: a first node implementing a first node process including receiving data packets via a first node wireless radio, sending data packets via said wireless radio, communicating with a network, and performing node link tree housekeeping functions; a plurality of second nodes, each second node implementing a second node process including sending and receiving data packet via a second node wireless radio, maintaining a send/receive data buffer in a digital memory, and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at

The '471 Patent – Claims	Geier Reference
	a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
selecting a link to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats

The '471 Patent – Claims	Geier Reference
	the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before

The '471 Patent – Claims	Geier Reference
	transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a

The '471 Patent – Claims	Geier Reference
	status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
the first node process further comprises maintaining a second node link tree having second node link entries, dynamically updating the tree to reflect the current operational status of the nodes, and rerouting data packets around inactive or malfunctioning nodes.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information,

The '471 Patent – Claims	Geier Reference
	node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence

The '471 Patent – Claims	Geier Reference
	and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is

The '471 Patent – Claims	Geier Reference
	operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
21. A wireless system as recited in claim 20, wherein the first node process further comprises: logic comparing a selected link from	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly

The '471 Patent – Claims	Geier Reference
one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and logic dynamically updating said second node link tree when said comparison meets predetermined conditions.	monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
22. A wireless system as recited in claim 21, wherein the first node process further includes:	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.

The '471 Patent – Claims	Geier Reference
logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; logic deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is already in said second node link tree; and logic inserting one of the plurality of said second nodes in said second node link tree if said second node is authentic.	
31. A wireless system comprising: a first node implementing a first node process including receiving data packets via a first node wireless radio, sending data packets via said wireless radio, and communicating with a network; a plurality of second nodes, each second node implementing a second node process including sending and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
receiving data packet via a second node wireless radio, maintaining a send/receive data buffer in a digital memory, and	the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
selecting a link to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is

The '471 Patent – Claims	Geier Reference
	specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing

The '471 Patent – Claims	Geier Reference
	decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident

The '471 Patent – Claims	Geier Reference
	node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
the first node process further	"The RCC calculates the best route (normally in terms of least delay) and sends each node

The '471 Patent – Claims	Geier Reference
comprises maintaining a second node link tree having second node link entries.	new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here,

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit.,

The '471 Patent – Claims	Geier Reference
	then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	"After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
32. A wireless system as recited in claim 31, wherein the first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and logic updating said second node link tree when said comparison meets predetermined conditions.	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide

The '471 Patent – Claims	Geier Reference
	just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
33. A wireless system as recited in claim 32, wherein the first node process further includes: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; logic deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is already in said second node link tree; and logic inserting one of the plurality of said second nodes in said second node link tree if said second node is authentic.	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
34. A method for providing wireless network communication comprising: providing a first node implementing a first node process including receiving data packets via R.F. transmission and sending data packets via R.F. transmission; providing a plurality of second nodes, each second node providing a second node process including sending and receiving data packet via R.F. transmission, maintaining a send/receive data buffer in digital memory, and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways,

The '471 Patent – Claims	Geier Reference
	including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
selecting a transmission path to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and maintaining a second node link tree having second node link entries at the first node.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may

The '471 Patent – Claims	Geier Reference
	benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is

The '471 Patent – Claims	Geier Reference
	to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
35. A method as recited in claim 34, wherein said first node process further includes: comparing a selected link from one of the plurality of said second nodes to said first node to a second node link entry in said second node link tree; and updating said second node link tree when said comparison meets at least one of several predetermined conditions.	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the

The '471 Patent – Claims	Geier Reference
	table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
36. A method as recited in claim 34, wherein said first node process further includes: determining if one of the plurality of said second nodes is authentic; deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is already in said second node link tree; and inserting one of the plurality of said second nodes in said second node tree if said second node is authentic.	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
40. In a network including a plurality of client nodes having a client radio modem and a client controller which	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network

The '471 Patent – Claims	Geier Reference
implements a client process including receiving and transmitting data packets via said client node to other nodes in the network, a server node comprising: a server node radio modem; and a server node controller implementing a server process, said server process configured to:	routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).

The '471 Patent – Claims	Geier Reference
receive selected transmission paths from each of the plurality of client nodes, wherein said transmission path is one of a direct link to the server node and an indirect link to said server node through at least one other client node;	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head

The '471 Patent – Claims	Geier Reference
	off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109.

The '471 Patent – Claims	Geier Reference
	"If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide

The '471 Patent – Claims	Geier Reference
	just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
determine an optimized transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes; and send the optimized transmission path for each of the plurality of client nodes to the respective client node.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '471 Patent – Claims	Geier Reference
	"Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the

The '471 Patent – Claims	Geier Reference
	least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113.

The '471 Patent – Claims	Geier Reference
	"A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
41. The server node of claim 40, wherein the server process is further configured to perform gateway functions.	It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

Invalidity Chart for U.S. Patent No. 8,625,496

The '496 Patent – Claims	Geier Reference
1. A wireless network system comprising: a server including a server controller and a server radio modem, said server controller implementing a server process that includes the control of said server radio modem, said server process including the receipt and transmission of data packets via said server radio modem; a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes the control of said client radio modem, said client process including the receipt and transmission of data packets via said client radio modem,	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients; and	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108.

The '496 Patent – Claims	Geier Reference
	"On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the

The '496 Patent – Claims	Geier Reference
	table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein the server process is configured to: receive information identifying the selected transmission path from each of the plurality of clients; determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients; send information identifying the server selected transmission path for each of the clients to the respective clients; and maintain a client link tree having client link entries representing each of the plurality of clients.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information

The '496 Patent – Claims	Geier Reference
	as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before

The '496 Patent – Claims	Geier Reference
	retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
2. A wireless network system comprising: a server including a server controller and a server radio modem, said server controller implementing a server process that includes the control of said server radio modem, said server process including the receipt and transmission of data packets via said server radio modem; and a plurality of clients each including a	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
client controller and a client radio modem, said client controller implementing a client process that includes the control of said client radio modem, said client process including the receipt and transmission of data packets via said client radio modem,	operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07.

The '496 Patent – Claims	Geier Reference
	"The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein said server process further includes logic that maintains a client	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the

The '496 Patent – Claims	Geier Reference
link tree having client link entries representing each of the plurality of clients, and wherein the server process is configured to: receive information identifying the selected transmission path from each of the plurality of clients, determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, and send information identifying the server selected transmission path for each of the clients to the respective clients.	network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as

The '496 Patent – Claims	Geier Reference
	before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
3. A wireless network system as recited in claim 2, wherein said server process is further configured to: compare a selected link from said client to said server to a current client link entry in said client link tree; and update said client link tree when said comparison meets predetermined conditions.	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113.

The '496 Patent – Claims	Geier Reference
	"After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
4. A wireless network system as recited in claim 2, wherein said server process is further configured to: determine if said client is authentic; determine if said client is already in said client link tree if said client is determined to be authentic; delete said client from said client link tree if said client is authentic and is already in said client link tree; and insert said client in said client link tree if said client is authentic and is not already in said client link tree.	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
5. The wireless network system of claim 2, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through

The '496 Patent – Claims	Geier Reference
	the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07.

The '496 Patent – Claims	Geier Reference
	"The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or

The '496 Patent – Claims	Geier Reference
	near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
7. A wireless network system	"With packet radio networks, the distance between source and destinat.ion nodes

The '496 Patent – Claims	Geier Reference
comprising: a server providing a server process including receiving data packets via a server wireless communication, sending data packets via said wireless communication, communicating with a network, and performing housekeeping functions; and a plurality of clients, each client providing a client process including sending and receiving data packet via a client wireless communication, maintaining a send/receive data buffer in digital memory, and	typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network

The '496 Patent – Claims	Geier Reference
	interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away

The '496 Patent – Claims	Geier Reference
	(tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein said server process further comprises maintaining a client link tree having client link entries representing each of the plurality of clients, and wherein the server process is configured to: receive information identifying the selected transmission path from each of the plurality of clients, determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the server selected transmission path, and send information identifying the server selected transmission path for each of the clients to the respective	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually

The '496 Patent – Claims	Geier Reference
clients.	have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count,

The '496 Patent – Claims	Geier Reference
	and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done,

The '496 Patent – Claims	Geier Reference
	continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
8. A wireless network system as recited in claim 7, wherein said server process is further configured to: compare a selected link from said client to said server to a current client link entry in said client link tree; and update said client link tree when said comparison meets predetermined conditions.	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
9. A wireless network system as recited in claim 7, wherein said server process is further configured to: determine if said client is authentic; determine if said client is already in said client link tree if client is determined to be authentic; delete said client from said client link tree if said client is authentic and is already in said client link tree; and insert said client in said client link tree if said client is authentic and is	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.

The '496 Patent – Claims	Geier Reference
not already in said client link tree.	
10. The wireless network system of claim 7, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away

The '496 Patent – Claims	Geier Reference
	(tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions

The '496 Patent – Claims	Geier Reference
	between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through

The '496 Patent – Claims	Geier Reference
	particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
11. A method for providing wireless network communication comprising: utilizing a server implementing a server process including receiving data packets via RF transmission, sending data packets via RF transmission, communicating with a network, and performing housekeeping functions; and utilizing a plurality of clients, each client providing a client process including sending and receiving data packet via RF transmission, maintaining a send/receive data buffer in digital memory, and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software

The '496 Patent – Claims	Geier Reference
	interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the

The '496 Patent – Claims	Geier Reference
	status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node

The '496 Patent – Claims	Geier Reference
	addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111.

The '496 Patent – Claims	Geier Reference
	"Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein the server process: receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, sends information identifying the	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
server selected transmission path for each of the clients to the respective clients; and maintains a client link tree having client link entries representing each of the plurality of clients.	"With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node

The '496 Patent – Claims	Geier Reference
	transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
12. A method for providing wireless network communication comprising: utilizing a server implementing a	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
server process including receiving data packets via RF transmission, sending data packets via RF transmission, communicating with a network, and performing housekeeping functions; and utilizing a plurality of clients, each client providing a client process including sending and receiving data packet via RF transmission, maintaining a send/receive data buffer in digital memory, and	routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head

The '496 Patent – Claims	Geier Reference
	off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide

The '496 Patent – Claims	Geier Reference
	just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein said server process further includes maintaining a client link tree having client link entries representing each of the plurality of clients, and wherein the server process: receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the server selected transmission path, and sends information identifying the server selected transmission path for each of the clients to the respective clients.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the

The '496 Patent – Claims	Geier Reference
	least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113.

The '496 Patent – Claims	Geier Reference
	"A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
13. A method as recited in claim 12, wherein said server process further includes: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
14. A method as recited m claim 12, wherein said server process further includes: determining is said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is authentic and is already in said client link tree; and inserting said client in said client link tree if said client is authentic and is not already in said client link tree.	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
15. The method of claim 12, wherein	"The RCC calculates the best route (normally in terms of least delay) and sends each node

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
the client link entries correspond to the server selected transmission path between the server and the respective client.	new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here,

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit.,

The '496 Patent – Claims	Geier Reference
	then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
16. A method for providing wireless network communication comprising the steps of: a server process including a data packet reception step, a data packet transmission step, a network communication step, and a housekeeping step; and a plurality of clients each providing a client process including a data sending and receiving step, a send and receive data buffer maintenance step, and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
a transmission path selection step wherein the transmission path is one of a direct link to a server and an indirect link to said server through at least one of the remainder of said plurality of clients,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to

The '496 Patent – Claims	Geier Reference
	each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly

The '496 Patent – Claims	Geier Reference
	monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1

The '496 Patent – Claims	Geier Reference
	entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein the server process: receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, sends information identifying the server selected transmission path for each of the clients to the respective clients; and	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research

The '496 Patent – Claims	Geier Reference
maintains a client link tree having client link entries representing each of the plurality of clients.	Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have

The '496 Patent – Claims	Geier Reference
	complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident

The '496 Patent – Claims	Geier Reference
	and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
17. A method for providing wireless network communication comprising the steps of: a server process including a data packet reception step, a data packet transmission step, a network	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
communication step, and a housekeeping step; and a plurality of clients each providing a client process including a data sending and receiving step, a send and receive data buffer maintenance step, and	explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
a link selection step wherein the transmission path is one of a direct link to a server and an indirect link to	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
said server through at least one of the remainder of said plurality of clients,	"In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the

The '496 Patent – Claims	Geier Reference
	truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein said server process further comprises the step of maintaining a client link tree having client link entries representing each of the plurality of clients, and wherein the server process: receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the server selected transmission path, and sends information identifying the server selected transmission path for each of the clients to the respective clients.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having

The '496 Patent – Claims	Geier Reference
	each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may

The '496 Patent – Claims	Geier Reference
	benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
18. A method as recited m claim 17, wherein said server process further comprises the steps of: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
19. A method as recited in claim 17, wherein said server process further comprises steps of: determining if said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is authentic and is already in said client link tree; and inserting said client into said client link tree if said client is authentic and is not already in said client link tree.	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
20. The method of claim 17, wherein the client link entries correspond to the server selected transmission path	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105.

The '496 Patent – Claims	Geier Reference
between the server and the respective client.	"In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has

The '496 Patent – Claims	Geier Reference
	a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the

The '496 Patent – Claims	Geier Reference
	new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
21. A wireless network system comprising: a first node including a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling of said first node radio modem, said first node process including receiving and transmitting data packets via said first node radio modem; a plurality of second nodes each including a second node controller implementing a second node process that includes controlling a second node radio modem, said second node process including receiving and transmitting data packets via said second node radio modem,	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109.

The '496 Patent – Claims	Geier Reference
	It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
wherein said second node process of each of said second nodes includes initiating a radio transmission path to said first node that is a link to said first node through at least one of the remainder of said plurality of second nodes,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the

The '496 Patent – Claims	Geier Reference
	nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will

The '496 Patent – Claims	Geier Reference
	make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
wherein said first node process dynamically updates a second node link tree comprising second node link entries representing each of the plurality of second nodes and dynamically modifies the second node link tree so that the data packet transmission path to the first node is optimized.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107.

The '496 Patent – Claims	Geier Reference
	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111.

The '496 Patent – Claims	Geier Reference
	"Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
22. A wireless network system as recited in claim 21, wherein at least one of the second nodes is a mobile device and said first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the

The '496 Patent – Claims	Geier Reference
second node link entry in said second node link tree; and logic dynamically updating said second node link tree when said comparison meets predetermined conditions.	least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
23. A wireless network system as recited in claim 21, wherein said first node process further comprises: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; and logic inserting one of the plurality of said second nodes in said second node link tree if one of the plurality of said second nodes is authentic and is not already in said second node link tree.	
24. In a wireless system comprising a plurality of second nodes, each second node implementing a second node process including sending and receiving data packet via a second node wireless radio, maintaining a send/receive data buffer in a digital memory, and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
selecting a link to a first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay

The '496 Patent – Claims	Geier Reference
	to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107.

The '496 Patent – Claims	Geier Reference
	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate

The '496 Patent – Claims	Geier Reference
	direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
a first node configured to implement a first node process, the first node process including: receiving data packets via a first node wireless radio; sending data packets via said wireless radio; communicating with a network;	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
performing node link tree housekeeping functions;	"Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
maintaining a second node link tree having second node link entries representing each of the plurality of second nodes; dynamically updating the tree to	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
reflect the current operational status of the second nodes; and rerouting data packets around inactive or malfunctioning second nodes.	source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is

The '496 Patent – Claims	Geier Reference
	causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.

The '496 Patent – Claims	Geier Reference
25. The first node of claim 24, wherein the first node process further includes: comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and dynamically updating said second node link tree when said comparison meets predetermined conditions.	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet.

The '496 Patent – Claims	Geier Reference
	This ensures other nodes get the updates as soon as possible." Geier at 113.
26. The first node of claim 24, wherein the first node process further includes: determining if one of the plurality of said second nodes is authentic; determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is authentic and is already in said second node link tree; and inserting one of the plurality of said second nodes in said second node link tree if said second node is authentic and is not already in said client link tree.	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
27. In a wireless system comprising a plurality of second nodes and a first node configured to implement a first	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network

The '496 Patent – Claims	Geier Reference
node process, the first node process including receiving data packets via a first node wireless radio, sending data packets via said wireless radio, communicating with a network, performing node link tree housekeeping functions,	routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
maintaining a second node link tree having second node link entries representing each of the plurality of second nodes, dynamically updating the tree to reflect the current operational status of the second nodes, and rerouting data packets around inactive or malfunctioning second nodes, a second node in the plurality of second nodes,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109.

The '496 Patent – Claims	Geier Reference
	"If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide

The '496 Patent – Claims	Geier Reference
	just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
the second node configured to implement a second node process including: sending and receiving data packet via a second node wireless radio; maintaining a send/receive data buffer in a digital memory; and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
selecting a link to the first node that is one of a direct link to the first node and an indirect link to the first node through at least one of the remainder of the plurality of second nodes.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to

The '496 Patent – Claims	Geier Reference
	each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly

The '496 Patent – Claims	Geier Reference
	monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
33. In a wireless network system comprising a plurality of second nodes each including a second node controller configured to implement a second node process that includes controlling a second node radio modem, receiving and transmitting data packets via said second node radio modem, and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
initiating a radio transmission path to a first node that is a direct link to said first node through at least one of the remainder of said plurality of second nodes,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the

The '496 Patent – Claims	Geier Reference
	circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
the first node comprising: a first node controller; and a first node radio modem, wherein said first	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network

The '496 Patent – Claims	Geier Reference
node controller is configured to implement a first node process comprising: controlling said first node radio modem; receiving and transmitting data packets via said first node radio modem; and	routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).

The '496 Patent – Claims	Geier Reference
maintaining a second node link tree comprising second node link entries representing each of the plurality of second nodes.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head

The '496 Patent – Claims	Geier Reference
	off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109.

The '496 Patent – Claims	Geier Reference
	"If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
34. A wireless network system as recited in claim 33, wherein said first node process further comprises: comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and updating said second node link tree when said comparison meet predetermined conditions.	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
35. A wireless network system as recited in claim 33, wherein said first node process further comprises: determining if one of the plurality of said second nodes is authentic; determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; and inserting one of the plurality of said second nodes in said second node link tree if one of the plurality of said second nodes is authentic and is not already in said client link tree.	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.
36. In a wireless network system comprising a plurality of second nodes and a first node, the first node comprising a first node controller and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition,

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
a first node radio modem, wherein said first node controller is configured to implement a first node process that includes controlling said first node radio modem, receiving and transmitting data packets via said first node radio modem, and	current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
maintaining a second node link tree	"The RCC calculates the best route (normally in terms of least delay) and sends each node

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
comprising second node link entries representing each of the plurality of second nodes, at least one second node in the plurality of second nodes comprising:	new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here,

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit.,

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
a second node controller configured to implement a second node process that includes controlling a second node radio modem, receiving and transmitting data packets via said second node radio modem,	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
initiating a radio transmission path to a first node that is a direct link to said first node through at least one of the remainder of said plurality of second nodes.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually

The '496 Patent – Claims	Geier Reference
	have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count,

The '496 Patent – Claims	Geier Reference
	and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done,

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
37. A method for providing wireless network communication comprising: implementing in a first node a first node process including receiving data packets via R.F. transmission and sending data packets via R.F. transmission; implementing in each of a plurality of second nodes a second node process including sending and receiving data packet via R.F. transmission, maintaining a send/receive data buffer in digital memory, and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both."

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
selecting a transmission path to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and maintaining a second node link tree having second node link entries representing each of the plurality of second nodes at the first node.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106.

The '496 Patent – Claims	Geier Reference
	"With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node

The '496 Patent – Claims	Geier Reference
	transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a

The '496 Patent – Claims	Geier Reference
	response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
38. A method as recited in claim 37, wherein said first node process further includes:	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
comparing a selected link from one of the plurality of said second nodes to said first node to a second node link entry in said second node link tree; and updating said second node link tree when said comparison meets at least one of several predetermined conditions.	retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
39. A method as recited in claim 37, wherein said first node process	It would have been obvious to implement authentication of clients and maintenance of the network map, including the addition and deletion of nodes.

The '496 Patent – Claims	Geier Reference
further includes: determining if one of the plurality of said second nodes is authentic; deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is authentic and is already in said second node link tree; and inserting one of the plurality of said second nodes in said second node tree if said second node is authentic and is not already in said client link tree.	
40. In a network including a plurality of client nodes having a client radio modem and a client controller which implements a client process including receiving and transmitting data packets via said client node to other nodes in the network, a server node comprising: a server node radio modem; and a server node controller implementing a server process, said server process configured to:	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105.

The '496 Patent – Claims	Geier Reference
	"Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
receive information identifying selected transmission paths from each of the plurality of client nodes, wherein said transmission path is one of a direct link to the server node and an indirect link to said server node through at least one other client node;	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information,

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence

The '496 Patent – Claims	Geier Reference
	and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is

The '496 Patent – Claims	Geier Reference
	operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
determine a server selected transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes;	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the

The '496 Patent – Claims	Geier Reference
send information identifying the server selected transmission path for each of the plurality of client nodes to the respective client node; and maintain a client link tree having client link entries representing each of the plurality of client nodes.	source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three

The '496 Patent – Claims	Geier Reference
	hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is

The '496 Patent – Claims	Geier Reference
	causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
41. The server node of claim 40, wherein the server process is further configured to perform gateway functions.	It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
42. A server for use in a wireless network system including a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes controlling said client radio modem, receiving and transmitting data packets via said client radio modem,	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast

The '496 Patent – Claims	Geier Reference
	radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet.

The '496 Patent – Claims	Geier Reference
	Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
said server comprising: a server controller and a server radio modem, said server controller implementing a server process that includes the controlling of said server radio modem, receiving and transmitting of data packets via said server radio modem,	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
maintaining a client link tree having client link entries representing each of the plurality of clients, and receiving information identifying the selected transmission path from each of the plurality of clients,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a

The '496 Patent – Claims	Geier Reference
determining a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, and sending information identifying the server selected transmission path for each of the clients to the respective clients.	needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the

The '496 Patent – Claims	Geier Reference
	nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar

The '496 Patent – Claims	Geier Reference
	to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.

The '496 Patent – Claims	Geier Reference
44. The server of claim 42, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is

The '496 Patent – Claims	Geier Reference
	arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
45. A first node for use in wireless network system including a plurality of second nodes each including a second node controller implementing a second node process that includes controlling a second node radio modem, receiving and transmitting data packets via said second node radio modem,	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at

The '496 Patent – Claims	Geier Reference
	a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
wherein said second node process of each of said second nodes includes initiating a radio transmission path to said first node that is a link to said first node through at least one of the remainder of said plurality of second nodes,	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats

The '496 Patent – Claims	Geier Reference
	the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07. "The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before

The '496 Patent – Claims	Geier Reference
	transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.
said first node comprising: a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling said first node radio modem, receiving and transmitting data packets via said first node radio modem, and	"With packet radio networks, the distance between source and destinat.ion nodes typically necessitates one or more nodes to relay data to the final destination. Thus, some form of routing must. take place. This paper explains several current network routing algorithms and shows their relevance to packet, radio networks. In addition, current research at. AFIT concerning the development of an automatic routing algorithm for Air Force Logistics Command's (AFLC) HF packet radio network is explained." Geier at 105. "Most routing algorithms store node address information in tables, which show the next node to receive a packet. These routing algorithms may be static or dynamic. If the algorithms are static (nonadaptive) the table entries do not change during normal

The '496 Patent – Claims	Geier Reference
	operateion of the network. Dynamic (adaptive) routing algorithms periodically update the tables to reflect changes in the network's topology or utilization or both." Geier at 105. "Each node in AFLC's packet radio network consists of an Advanced Electronics Applications, Inc. PIG232 Multi-Mode Data Controller, which acts as a terminal node controller (TNC). In addition, each TNC connects to an AN/URC-119 (HF) broadcast radio that prepares the data for transmission through the atmosphere. A software interface, written at AFIT, interfaces with the TNC. The interface allows an operator at a node location to send text messages to other node sites. The TNC controls the HF radio and accepts commands from the operator via the software interface." Geier at 109. It would have been obvious for a node in the network to serve as a gateway to, e.g., the internet, so that a node could access a web server, e.g., as such was well-known in the art. Such a gateway would provide translation between the networks and appropriate formatting of packets. Various references disclose such gateways, including Kahn 1978 and V. G. Cerf and P. T. Kirstein, "Issues in packet network interconnection," Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978).
dynamically updating a second node link tree comprising second node link entries representing each of the plurality of second nodes so that the data packet transmission path to the first node is optimized.	"The RCC calculates the best route (normally in terms of least delay) and sends each node new routing table information depending on the most recently measured state of the network." Geier at 105. "In most cases, a source node needing to send data packets can notify the RCC of the source and destination. The RCC will respond with a special call request packet called a needle packet, that contains the route which is the most efficient circuit. The route is specified as an ordered set of nodes. The source node then sends the needle packet through

The '496 Patent – Claims	Geier Reference
	the network to establish the circuit, and then data packets can follow." Geier at106. "With distributed routing, each node distributes routing metrics (connectivity information, node delays) throughout the network, enabling other nodes to update routing tables. Distributed routing has proven to be very robust with ARPANET (Advanced Research Project Agency Network). Within AR.PANET, each node periodically measures the delay to each node within one transmission hop and puts this information into a status packet. Nodes within one transmission hop are known as neighbors. The node then transmits the status packet to each neighbor, which records the status information. Each neighbor repeats the delay measuring process, formulates a status packet containing local delay information as well as delay information from incoming status packets and sends this status packet to each of its neighbors. By having all nodes follow this process, each node will eventually have an overall "picture" of the network in terms of node-to- node delays. Each of the nodes can then determine the route of least delay by referring to the status information received from other nodes." Geier at 106. "Jubin and Tornow explain that the DARPA (Defense Advanced Research Project Agency) packet radio network (not ARPANET) applies distributed routing techniques by having each node maintain a tier table [2]. The tier table specifies nodes that are one hop away (tier 1), two hops away (tier 2), three hops away (tier 3), and so on. The tier table is arranged in a matrix format. The tiers represent. the rows, whereas the tier 1 entries head off the columns. For example, node X could have a tier table as shown in Figure 1. Here, nodes A, B, and C are neighbors of node X; nodes D and E are neighbors of node A; node N and J are neighbors of node D; node F is a neighbor of node B, and so on. If node X has a packet needing transmission to node F, node X would choose to send the packet to node F via node B because the transmission would take only two hops in comparison to three hops if sent via node C. The tier table gives information regarding connectivity among the nodes; therefore, software at the source node may use the tables to make effective routing decisions." Geier at 106-07.

Exhibit B12 – Invalidity Chart for Brownrigg Family based on

The '496 Patent – Claims	Geier Reference
	"The nodes update their tier tables in the following manner. Every 7.5 seconds, each node transmits a Packet. Radio Organization Packet (PROP) that announces the node's existence and includes a copy of its tier table. A node receiving a PROP simply includes the information in its own tier table. After a period of time, all nodes in the network will have complete connectivity information for the entire network." Geier at 107. "The backward learning approach assumes data packet headers contain source node addresses and hop counters. The source node initializes the hop counter to zero before transmitting the packet, and intermediate nodes increment the hop counter by one before retransmitting the packet. For the purpose of updating routing tables, each node constantly monitors the incoming packets by noting the packet's original source address, hop count, and address of the immediately preceding node. With this information, a node can make educated decisions on which node to send outgoing packets to for delivery to a specific 1ocation. A node transmits a packet to the neighbor where packets came from with the least hop count and originated from the desired destination node." Geier at 108. "On the other hand, a network with highly mobile nodes and limited bandwidth may benefit from a backward learning technique if there are frequent data transmissions between nodes." Geier at 109. "If for some reason the network can not support a connection by way of the chosen circuit., then the algorithm will choose another circuit. based on the same routing table level as before if another destination node entry resides at that) level or drop down through the truth table to higher-numbered levels until another destination node entry is found. In addition, the algorithm will initiate a probing that will determine which part of the circuit is causing the original circuit to be faulty. The algorithm will accomplish the probing similar to the method technicians use to manually troubleshoot a faulty circuit. First, the resident node will fabricate and send a probe packet that is addressed to an intermediate node at or

The '496 Patent – Claims	Geier Reference
	near the center of the faulty circuit. If this node is available and still connected to the circuit., it will send an immediate response to the sender. If the resident node receives a response from the intermediate node, the resident node can assume the circuit is operational up to the that point in the circuit, and if the resident node does not4 receive a response, the resident node can assume the problem lies somewhere between the resident and the intermediate node. The resident node will continue probing in the appropriate direction until a faulty node pair is found." Geier at 111. "Routinely, a node inherently sends redundant looping information when sending a status packet. The reason for this is that the status packet contains a copy of the routing table of the sender which normally includes the receiving node's level 1 entries. This causes the looping redundancy in Figure 4(a). In fact, if nothing is done, continual status transmissions will not only cause looping in the tables, but it will make the routing tables grow in length without bound." Geier at 113. "A method to reduce the looping and endless routing table growth is to "prune" the table after using the status packet to update table entries. The objective in pruning is to delete any parts of the routing table that represent circuits with a loop through particular nodes (not only the resident node). By eliminating all circuits that cause this looping, the resulting pruned table will not grow indefinitely, and it will provide just enough redundancy to accommodate valid alternate routes." Geier at 113. "After pruning, the resident node will immediately broadcast a status packet if the new routing table structure is different than before receiving the last status packet. This ensures other nodes get the updates as soon as possible." Geier at 113.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

Invalidity Chart for U.S. Patent No. 6,249,516

The '516 Patent – Claims	Reasons for Patent Ineligibility
1. A server providing a gateway between two networks, where at least one of the two networks is a wireless network, said server comprising: a radio modem capable of communicating with a first network that operates, at least in part, by wireless communication; a network interface capable of communicating with a second network; and a digital controller coupled to said radio modem and to said network interface, said digital controller communicating with said first network via said radio modem and communicating with said second network via said network interface, said digital controller passing data packets received from said first network that are destined for said second network to said second network, and passing data packets received from said second network that are destined for said first network to said first network,	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "gateway," "clients," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." It is said to include a generic "controller" and a generic "radio modem," but does not specify any structures that improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers and radio communications and is nothing more than abstraction of a generic radio communication in a gateway environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients with any controllers and any radios making any transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses).

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '516 Patent – Claims	Reasons for Patent Ineligibility
	Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
said digital controller maintaining a map of data packet transmission paths of a plurality of clients of said first network, where a transmission path of a client of said first network to said server can be through one or more of other clients of said first network;	The "map" clause is abstract. It adds a "map of data packet transmission paths of a plurality of clients," and states that a "path" can be "through one or more of other clients of said first network," which is not limiting, as it would seemingly be true of every "transmission path." Thus, the map is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The map does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a map is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '516 Patent – Claims	Reasons for Patent Ineligibility
wherein said digital controller changes the transmission paths of clients to optimize the transmission paths including changing the transmission path from the client to the gateway so that the path to the gateway is chosen from the group consisting essentially of the path to the gateway through the least possible number of additional clients, the path to the gateway through the most robust additional clients, the path to the gateway through the clients with the least amount of traffic, and the path to the gateway through the fastest clients.	The "changes the transmission paths" clause is abstract. It adds "changes the transmission paths of clients to optimize the transmission paths including changing the transmission path from the client to the gateway" based on choices from a group. The limitation is abstract. It is not expressed how the transmission paths are "changed," for example. Moreover, in a network environment, controllers that "change" paths are common. Thus, the changing recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The changing the transmission paths recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, changing paths is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
2. A server as recited in claim 1, wherein the second network is a TCP/IP protocol network.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. In addition, the type of protocol used in the second network (i.e., "TCP/IP protocol") does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, TCP/IP protocol is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '516 Patent – Claims	Reasons for Patent Ineligibility
	included in these responses.
4. A server as recited in claim 1, wherein the digital controller translates data packets received from the second network and destined for the first network into a format used by the first network, and the digital controller translates data packets received from the first network and destined for the second network into a format used by the second network.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. In addition, translation of data packets does not add "significantly more" to the abstract radio network of the claim. Further, that a gateway translates data packets between networks is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
5. A server as recited in claim 2: wherein the digital controller receives data packets from the TCP/IP protocol network destined for a client of the first network, adds a header that includes an address of the client of the first network and a data transmission path to the client of the first network, adds a indicator of the type of data associated with the packet, and transmits the packet via the radio modem with the header and the indicator; and	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. In addition, translation of data packets and addition of headers with address and indicator information does not add "significantly more" to the abstract radio network of the claim, especially as the information is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, that a gateway translates data packets between networks is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '516 Patent – Claims	Reasons for Patent Ineligibility
wherein the digital controller receives data packets from the first network destined for the TCP/IP protocol network, converts the data packets into TCP/IP format, and sends the TCP/IP format data packet to an IP address on the TCP/IP protocol network.	
10. A method providing a gateway between a wireless network and a second network comprising: receiving a data packet from a client of said wireless network, converting said data packet to a proper format for said second network, and sending said data packet to said second network; and receiving a data packet from said second network, adding a header to said packet including a reverse link and a data packet type if said data packet is destined for a client of said wireless network, said reverse link being one of a direct link to said client and an indirect link to said client through one or more other clients of said network, and transmitting said	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "gateway," "clients," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." It is said to include a generic "controller" and a generic "radio modem," but does not specify any structures that improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers and radio communications and is nothing more than abstraction of a generic radio communication in a gateway environment. The claimed networking elements do not provide "significantly more" as *Alice*

The '516 Patent – Claims	Reasons for Patent Ineligibility
data packet with said header; and	requires. These elements are merely any servers and any clients with any controllers and any radios making any transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Moreover, translation of data packets and addition of headers with address and indicator information does not add "significantly more" to the abstract radio network of the claim, especially as the information is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, that a gateway translates data packets between networks is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients.

The '516 Patent – Claims	Reasons for Patent Ineligibility
	The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
changing transmission paths of clients to optimize the transmission paths including changing the transmission path from the client to the gateway so that the path to the gateway is chosen from the group consisting essentially of the path to the gateway through the least possible number of additional clients, the path to the gateway through the most robust additional clients, the path to the gateway through the clients with the least amount of traffic, and the path to the gateway through the fastest clients.	The "changing the transmission path" clause is abstract. It adds "changing transmission paths of clients to optimize the transmission paths including changing the transmission path from the client to the gateway" based on choices from a group. The limitation is abstract. It is not expressed how the transmission paths are "changed," for example. Moreover, in a network environment, "changing" paths is common. Thus, the changing recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The changing the transmission paths recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, changing paths is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
11. A method as recited in claim 10: wherein the second network is a TCP/IP protocol network; wherein the data packet received from a client of a wireless network is converted to a TCP/IP format if it is destined for an IP address on a TCP/IP protocol network, and the	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. In addition, the type of protocol used in the second network (i.e., "TCP/IP protocol") does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, TCP/IP protocol is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '516 Patent – Claims	Reasons for Patent Ineligibility
TCP/IP format data packet is sent to the IP address on the TCP/IP protocol network; and wherein the data packet received from the second network is received from the TCP/IP protocol network.	included in these responses.
13. A method as recited in claim 10 further comprising maintaining a map of data packet transmission paths of a plurality of clients of the wireless network, where a transmission path of a client of the wireless network to the server can be through one or more other clients of the first network.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. In addition, the "map" clause is abstract. It adds a "map of data packet transmission paths of a plurality of clients of the wireless network" can be "through one or more other clients of the first network," which is not limiting, as it would seemingly be true of every "transmission path." Thus, the map is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The map does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a map is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
14. A method as recited in claim 13, further comprising dynamically updating the map of data packet	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '516 Patent – Claims	Reasons for Patent Ineligibility
transmission paths to optimize the data packet transmission paths of the clients.	The "dynamically updating" clause is abstract. It adds a "dynamically updating the map of data packet transmission paths to optimize the data packet transmission paths of the clients." The limitation is abstract. It is not expressed how the transmission paths are "dynamically updated," for example, and Moreover, in a network environment, "updating" paths is common. Thus, the updating recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The updating recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, it does not add any meaningful limitation to a map due to the abstract nature of "optimization." Further, updating is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.

Invalidity Chart for U.S. Patent No. 8,000,314

The '314 Patent – Claims	Reasons for Patent Ineligibility
1. A wireless network system comprising: a first node including a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling said first node radio modem, said first node process including receiving and transmitting data packets via said first node radio modem; a plurality of second nodes each including a second node controller and a second node radio modem, said second node controller implementing a second node process that includes controlling of said second node radio modem, said second node process including receiving and transmitting data packets via said second node radio modem,	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "node" and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "nodes." It is said to include a generic "controller" and a generic "radio modem," but does not specify any structures that improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers and radio communications and is nothing more than abstraction of a generic radio communication in a wireless environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any nodes with any controllers and any radios making any transmissions of any data. They do not recite improvements to wireless communication structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this

The '314 Patent – Claims	Reasons for Patent Ineligibility
	case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communication with nodes. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic nodes. The core of what the claim is doing is the abstract idea of data networking through using nodes. The claim is patent ineligible under §101.
wherein said second node process of each of said second nodes includes selecting a radio transmission path to said first node that is direct or through at least one of the remainder of said plurality of second nodes; and	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "direct or through" does not save the claim from abstraction because "direct or through" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '314 Patent – Claims	Reasons for Patent Ineligibility
	illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
wherein said selected path to said first node utilizes the least number of other second nodes, such that said transmission path from each of said second nodes to said first node is optimized	The "utilizes the least number of other second nodes" clause is abstract. It adds utilizing "the least number of other second nodes, such that said transmission path from each of said second nodes to said first node is optimized." The limitation is abstract. It is not expressed how the transmission paths are "utilized," for example. Moreover, in a network environment, shortest path utilization of paths is common. Thus, the utilization recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The utilization recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Moreover, it does not add any meaningful limitation to a selection due to the abstract nature of "optimized." Selecting a path is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
and the first node controller implements changes to upgrade the selected transmission path in response to a request from at least one of said second nodes.	The "implements changes to upgrade the selected transmission path" clause is abstract. It adds implementing "changes to upgrade the selected transmission path in response to a request from at least one of said second nodes." The limitation is abstract. It is not expressed how the transmission paths are

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '314 Patent – Claims	Reasons for Patent Ineligibility
	"upgraded," for example, or how "a request" is made. Moreover, in a network environment, "upgrading" paths on request is common. Thus, the updating recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The upgrading recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, upgrading paths is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
4. A first node providing a gateway between a wireless network and a second network, the first node comprising: a first data packet receiver configured to receive a data packet from a second node of said wireless network, a first converter configured to convert the data packet to a format used in said second network, and a data packet sender configured to send the data packet to a proper location on said second network; and a second data packet receiver configured to receive the data packet from said second network, a second	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "node," "gateway," "and "packet receiver") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "nodes" or "gateway." It is said to include a generic "gateway" and a generic "receivers" and "converters," but does not specify any structures that improve the gateway. Instead, the gateway simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to gateways and is nothing more than abstraction of a generic radio communication in a gateway environment.

The '314 Patent – Claims	Reasons for Patent Ineligibility
converter configured to convert the data packet to a format used in said wireless network, and a data packet sender configured to send said data packet with a header to a second node of said wireless network; and	The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any gateway. They do not recite improvements to radio communication structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of the use of a gateway for radio communication. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through a gateway. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic gateway communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic gateways. The core of what the claim is doing is the abstract idea of data networking using a gateway. The claim is patent ineligible under §101.
a controller configured to implement changes to a transmission path from the second node to the first node based upon viable network paths observed by the second node so that	The implementing "a controller configured to implement changes to a transmission path from the second node to the first node based upon viable network paths observed by the second node so that the path to the first node" is based on choices from a group.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '314 Patent – Claims	Reasons for Patent Ineligibility
the path to the first node is chosen from the group consisting essentially of the path to first node through the least possible number of additional second nodes, the path to the first node through the most robust additional second nodes, the path to the first node through the second nodes with the least amount of traffic, and the path to the first node through the fastest second nodes.	The limitation is abstract. It is not expressed how the transmission paths are "changed," for example. Moreover, in a network environment, "changing" paths is common. Thus, the changing recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The changing the transmission paths recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, changing paths is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
10. A client node in a network including a server node having a server radio modem and a server controller which implements a server process that includes controlling the server node to receive and transmit data packets via said server node to other nodes in the network, the client node comprising: a client node radio modem; and a client node controller; said client node controller implementing a process including receiving and transmitting data packets via said client modem;	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server node," "client node," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server node" or "client node." They are said to include generic "controllers" and a generic "radio modems," but do not specify any structures that improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers

The '314 Patent – Claims	Reasons for Patent Ineligibility
	and radio communications and is nothing more than abstraction of a generic radio communication in a wireless environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any server node and any client nodes with any controllers and any radios making any transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
selecting a radio transmission path to	The "selecting" limitation fails to recite anything more than an abstraction. The

The '314 Patent – Claims	Reasons for Patent Ineligibility
said server node that is one of a direct link to said server node and an indirect link to said server node through at least one other client node;	claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "one of a direct link to said server node and an indirect link to said server node through at least one other client node" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
implementing a process requesting updated radio transmission path data from said server node, and in response thereto, implementing by the server node changes to upgrade the selected transmission path to an optimized transmission path.	The "implementing a process requesting updated radio transmission path data from said server node" clause is abstract. It adds implementing "requesting updated radio transmission path data from said server node, and in response thereto, implementing by the server node changes to upgrade the selected transmission path to an optimized transmission path." The limitation is abstract. It is not expressed how the transmission paths are "upgraded," for example, or how "a process requesting" is implemented. Moreover, in

The '314 Patent – Claims	Reasons for Patent Ineligibility
	a network environment, "upgrading" paths on request is common. Thus, the updating recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The upgrading recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, upgrading paths is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
12. A first node providing a gateway between two networks, where at least one of the two networks is a wireless network, said first node comprising: a radio modem capable of communicating with a first network that operates in part, by wireless communication; a network interface to communicating with a second network; a digital controller coupled to said radio modem and to said network interface, said digital controller communicating with said first network via said radio modem and communicating with said second network via said network interface,	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "node," "gateway," "network interface," "controller," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "gateway" or "first node." It is said to include a generic "network interface," a generic "controller" and a generic "radio modem," but does not specify any structures that improve the interface, controller, or radio modem. Instead, the node simply communicates data in a well-known manner for a gateway. Thus, the claim language is ubiquitous to gateways, controllers, and radio communications and is nothing more than abstraction of a generic radio communication in a gateway

The '314 Patent – Claims	Reasons for Patent Ineligibility
said digital controller passing data packets received from said first network that are destined for said second network to said second network, and passing data packets received from said second network that are destined for said first network to said first network,	environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any gateway nodes with any controllers and any radios making any transmissions of any data. They do not recite improvements to gateway structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communication in a gateway environment. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions using a gateway. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic node communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic nodes and gateways. The core of what the claim is doing is the abstract idea of data networking using a gateway. The claim is patent ineligible under §101.
said digital controller maintaining a map of data packet transmission	The "map" clause is abstract. It adds a "map of data packet transmission paths to a plurality of second nodes of said first network," and states that a "path" can be

The '314 Patent – Claims	Reasons for Patent Ineligibility
paths to a plurality of second nodes of said first network, where a transmission path of a second node of said first network to said first node can be through one or more of other second node of said first network;	"through one or more of other second node of said first network," which is not limiting, as it would seemingly be true of every "transmission path." Thus, the map is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The map does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a map is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
wherein said digital controller changes the transmission paths of each of the second nodes to optimize the transmission paths including changing each transmission path from on of the plurality of said second nodes to the first node so that the path to the first node is chosen from the group consisting essentially of the path to the first node through the least possible number of additional second nodes, the path to the first node through the most robust additional second nodes, the path to the first node through the second nodes with the least amount of traffic, and the path to the first node through	The "changes the transmission paths" clause is abstract. It adds "changes the transmission paths of each of the second nodes to optimize the transmission paths including changing each transmission path from on of the plurality of said second nodes to the first node" based on choices from a group. The limitation is abstract. It is not expressed how the transmission paths are "changed," for example. Moreover, in a network environment, controllers that "change" paths are common. Thus, the changing recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The changing the transmission paths recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, changing paths is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '314 Patent – Claims	Reasons for Patent Ineligibility
the fastest second nodes.	
13. A first node as recited in claim 12, wherein the digital controller translates data packets received from the second network and destined for the first network into a format used by the first network, and the digital controller converts data packets received from the first network and destined for the second network into a format used by the second network.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. In addition, translation of data packets does not add "significantly more" to the abstract radio network of the claim. Further, that a gateway translates data packets between networks is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
14. A first node providing a gateway between a wireless network and a second network, the first node comprising: a first data packet receiver implementing a process to receive a data packet from a second node of said wireless network, a first converter implementing a process to convert said data packet to a format used in said second network, and a first transmitter implementing a process to transmit said data packet to a proper location on said second	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "node," "gateway," "and "packet receiver") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "nodes" or "gateway." It is said to include a generic "gateway" and a generic "receivers" and "converters," but does not specify any structures that improve the gateway. Instead, the gateway simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to gateways and is nothing

The '314 Patent – Claims	Reasons for Patent Ineligibility
network; and a second data packet receiver implementing a process to receive a data packet from said second network, a second converter implementing a process to convert said data packet to a format used in said wireless network, and a second transmitter implementing a process to transmit said data packet with a header to a second node of said wireless network; and	more than abstraction of a generic radio communication in a gateway environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any gateway. They do not recite improvements to radio communication structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of the use of a gateway for radio communication. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through a gateway. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic gateway communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic gateways. The core of what the claim is doing is the abstract idea of data networking using a gateway. The claim is patent ineligible under §101.
a controller implementing a process to change a transmission path to optimize a transmission path includes	The "change a transmission path" clause is abstract. It adds a controller to "change a transmission path to optimize a transmission path includes changing the transmission path from the second node to the first node" based on choices from a

The '314 Patent – Claims	Reasons for Patent Ineligibility
changing the transmission path from the second node to the first node so that the path to the first node is chosen from the group consisting essentially of the path to the first node through the least possible number of additional second nodes, the path to the first node through the most robust additional second nodes, the path to the first node through the second nodes with the least amount of traffic, and the path to the first node through the fastest second nodes.	group. The limitation is abstract. It is not expressed how the transmission paths are "changed," for example. Moreover, in a network environment, controllers that "change" paths are common. Thus, the changing recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The changing the transmission paths recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, changing paths is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.

Invalidity Chart for U.S. Patent No. 8,233,471

The '471 Patent – Claims	Reasons for Patent Ineligibility
2. A wireless network system comprising: a server including a server controller and a server radio modem, said server controller implementing a server process that includes the control of said server radio modem, said server process including the receipt and transmission of data packets via said server radio modem; and a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes the control of said client radio modem, said client process including the receipt and transmission of data packets via said client radio modem,	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "controller," "clients," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." It is said to include a generic "controller" and a generic "radio modem," but does not specify any structures that improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers and radio communications and is nothing more than abstraction of a generic radio communication in a server environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients with any controllers and any radios making any transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses).

The '471 Patent – Claims	Reasons for Patent Ineligibility
	Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients,	The "initiates and selects" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "one of a direct link to said server and an indirect link to said server" does not save the claim from abstraction because "one of a direct link to said server and an indirect link to said server" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '471 Patent – Claims	Reasons for Patent Ineligibility
	always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
wherein said server process further includes logic that maintains a client link tree having client link entries corresponding to an optimized transmission path for each of the plurality of clients, and	The "client link tree" clause is abstract. It adds "a client link tree having client link entries," and further recites "corresponding to an optimized transmission path for each of the plurality of clients," which does not add any meaningful limitation to a tree or its entries due to the abstract nature of "optimization." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
wherein the server process is configured to: receive the selected transmission path from each of the plurality of clients, determine the optimized transmission path for each of the plurality of clients based on the selected transmission	The "server process" clause is abstract. It adds that the server process is configured to "receive the selected transmission path from each of the plurality of clients," to "determine the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients," to "update the client link entries to provide the optimized transmission path," and to "send the optimized transmission path for each of the clients to the respective clients."

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '471 Patent – Claims	Reasons for Patent Ineligibility
paths received from the plurality of clients, update the client link entries to provide the optimized transmission path, and send the optimized transmission path for each of the clients to the respective clients.	Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "optimized" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "optimization." Moreover, in a network environment, processes that "update" a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed sending process. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, creating and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
3. A wireless network system as recited in claim 2, wherein said server process further comprises: logic that compares a selected link from said client to said server to a current client link entry in said client link tree; and logic that updates said client link tree when said comparison meets predetermined conditions.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined

The '471 Patent – Claims	Reasons for Patent Ineligibility
	conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
4. A wireless network system as recited in claim 3, wherein said server process further comprises:	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim.

The '471 Patent – Claims	Reasons for Patent Ineligibility
logic that determines if said client is authentic; logic that determines if said client is already in said client link tree if client is determined to be authentic; logic that deletes said client from said client link tree if said client is already in said client link tree; and logic that inserts said client in said client link tree if said client is authentic.	This claims add manipulations to a link tree, such as "determining," "deleting," and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '471 Patent – Claims	Reasons for Patent Ineligibility
	Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.
6. A wireless network system comprising: a server providing a server process including: receiving data packets via a server wireless communication, sending data packets via said wireless communication, communicating with a network, and performing housekeeping functions; and a plurality of clients, each client providing a client process including sending and receiving data packet via a client wireless communication, maintaining a send/receive data buffer in digital memory, and	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "housekeeping functions," "clients," and "wireless communication") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." They are said to include a generic "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients and any wireless transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '471 Patent – Claims	Reasons for Patent Ineligibility
	and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every path must be one or the other. That recitation is the

The '471 Patent – Claims	Reasons for Patent Ineligibility
	height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
wherein said server process further comprises maintaining a client link tree having client link entries corresponding to an optimized transmission path for each of the plurality of clients, and	The "client link tree" clause is abstract. It adds "a client link tree having client link entries," and further recites "corresponding to an optimized transmission path for each of the plurality of clients," which does not add any meaningful limitation to a tree or its entries due to the abstract nature of "optimization." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
wherein the server process is configured to: receive the selected transmission path	The "server process" clause is abstract. It adds that the server process is configured to "receive the selected transmission path from each of the plurality of clients," to "determine the optimized transmission path for each of the plurality of clients based

The '471 Patent – Claims	Reasons for Patent Ineligibility
from each of the plurality of clients, determine the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the optimized transmission path, and send the optimized transmission path for each of the clients to the respective clients.	on the selected transmission paths received from the plurality of clients," to "update the client link entries to provide the optimized transmission path," and to "send the optimized transmission path for each of the clients to the respective clients." Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "optimized" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "optimization." Moreover, in a network environment, processes that "update" a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed sending process. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, creating and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
7. A wireless network system as recited in claim 6, wherein said server process is further configured to: compare a selected link from said client to said server to a current client link entry in said client link tree; and	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept.

The '471 Patent – Claims	Reasons for Patent Ineligibility
update said client link tree when said comparison meets predetermined conditions.	The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '471 Patent – Claims	Reasons for Patent Ineligibility
8. A wireless network system as recited in claim 7, wherein said server process is further configured to: determine if said client is authentic; determine if said client is already in said client link tree if client is determined to be authentic; delete said client from said client link tree if said client is already in said client link tree; and insert said client in said client link tree if said client is authentic.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining," "deleting," and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described

The '471 Patent – Claims	Reasons for Patent Ineligibility
	throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.
10. A method for providing wireless network communication comprising: providing a server implementing a server process including receiving data packets via RF transmission, sending data packets via RF transmission, communicating with a network, and performing housekeeping functions; and providing a plurality of clients, each client providing a client process including sending and receiving data packet via RF transmission, maintaining a send/receive data buffer in digital memory, and	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "housekeeping functions," "clients," and "wireless communication") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." They are said to include a generic "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication.

The '471 Patent – Claims	Reasons for Patent Ineligibility
	The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients and any wireless transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur.

The '471 Patent – Claims	Reasons for Patent Ineligibility
	The recitation that the path is "one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
wherein the server process: receives the selected transmission path from each of the plurality of clients determines the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients updates the client link entries to provide the optimized transmission path, and	The "server process" clause is abstract. It adds that the server process "receives the selected transmission path from each of the plurality of clients," "determines the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients," "updates the client link entries to provide the optimized transmission path," and "sends the optimized transmission path for each of the clients to the respective clients." Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "optimized" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "optimization." Moreover, in a network environment, processes that "update" a network map are common, as is

The '471 Patent – Claims	Reasons for Patent Ineligibility
sends the optimized transmission path for each of the clients to the respective clients.	the notification to other nodes of an updated map, as called for in the claimed sending process. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, creating and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
11. A method as recited in claim 10, wherein said server process further includes: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics

The '471 Patent – Claims	Reasons for Patent Ineligibility
	are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
12. A method as recited in claim 11, wherein said server process further includes: determining is said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining," "deleting," and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic

The '471 Patent – Claims	Reasons for Patent Ineligibility
link tree if said client is already in said client link tree; and inserting said client in said client link tree if said client is authentic.	entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.

The '471 Patent – Claims	Reasons for Patent Ineligibility
14. A method for providing wireless network communication comprising the steps of: a server process including a data packet reception step, a data packet transmission step, a network communication step, and a housekeeping step; and a plurality of clients each providing a client process including a data sending and receiving step, a send and receive data buffer maintenance step, and	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "housekeeping step," "clients," and "data packet transmission") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." They are said to include a generic "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients and any wireless transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in

The '471 Patent – Claims	Reasons for Patent Ineligibility
	monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
a link selection step that is one of a direct link to a server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the link is "one of a direct link to a server and an indirect link to said server through at least one of the remainder of said plurality of clients" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every link must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection

The '471 Patent – Claims	Reasons for Patent Ineligibility
	boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
wherein said server process further comprises the step of maintaining a client link tree having client link entries corresponding to an optimized transmission path for each of the plurality of clients, and	The "client link tree" clause is abstract. It adds "a client link tree having client link entries," and further recites "corresponding to an optimized transmission path for each of the plurality of clients," which does not add any meaningful limitation to a tree or its entries due to the abstract nature of "optimization." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
wherein the server process: receives the selected transmission path from each of the plurality of clients, determines the optimized transmission path for each of the plurality of clients based on the selected transmission paths received	The "server process" clause is abstract. It adds that the server process "receives the selected transmission path from each of the plurality of clients," "determines the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients," "updates the client link entries to provide the optimized transmission path," and "sends the optimized transmission path for each of the clients to the respective clients." Receiving data is a well-known concept, and does not add "significantly more" to the

The '471 Patent – Claims	Reasons for Patent Ineligibility
from the plurality of clients, updates the client link entries to provide the optimized transmission path, and sends the optimized transmission path for each of the clients to the respective clients.	abstract radio network. With regard to "determining," it is not expressed how the "optimized" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "optimization." Moreover, in a network environment, processes that "update" a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed sending process. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, creating and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
15. A method as recited in claim 14, wherein said server process further comprises the steps of: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '471 Patent – Claims	Reasons for Patent Ineligibility
	manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
16. A method as recited in claim 15, wherein said server process further comprises steps of: determining if said client is authentic;	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining," "deleting," and

The '471 Patent – Claims	Reasons for Patent Ineligibility
determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is already in said client link tree; and inserting said client into said client link tree if said client is authentic.	"inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny

The '471 Patent – Claims	Reasons for Patent Ineligibility
	because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.
17. A wireless network system comprising: a first node including a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling of said first node radio modem, said first node process including receiving and transmitting data packets via said first node radio modem; a plurality of second nodes each including a second node controller implementing a second node process that includes controlling a second node radio modem, said second node process including receiving and transmitting data packets via said second node radio modem,	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "node" and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "nodes." It is said to include a generic "controller" and a generic "radio modem," but does not specify any structures that improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers and radio communications and is nothing more than abstraction of a generic radio communication in a wireless environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any nodes with any controllers and any radios making any transmissions of any data. They do not recite improvements to wireless communication structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional

The '471 Patent – Claims	Reasons for Patent Ineligibility
	activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communication with nodes. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic nodes. The core of what the claim is doing is the abstract idea of data networking through using nodes. The claim is patent ineligible under §101.
wherein said second node process of each of said second nodes includes initiating a radio transmission path to said first node that is a link to said first node through at least one of the remainder of said plurality of second nodes; and	The "initiating" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "a link to said first node through at least one of the remainder of said plurality of second nodes" does not save the claim from abstraction because it merely recites that the second nodes have an indirect channel of communication. Further, the "initiation" of an indirect communication path does not

The '471 Patent – Claims	Reasons for Patent Ineligibility
	add significantly more because it merely encompass typical packet radio communications, and is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
wherein said first node process dynamically updates a second node link tree comprising second node link entries and dynamically modifies the second node link tree so that the data packet transmission from the first node is optimized.	The "updating" and "modifying" clauses are abstract. It adds a process that "dynamically updates a second node link tree comprising second node link entries and dynamically modifies the second node link tree so that the data packet transmission from the first node is optimized." For example, it is not expressed how the link tree is "updated" or "modified," for example, rendering the language abstract, particularly due to the abstract nature of "optimized." Moreover, in a network environment, processes that "update" and "modify" link trees are common. Thus, the clauses are abstract in general because their characteristics are not described, and are abstract in particular because they are in no way implemented in the claim. The "updating" and "modifying" recitations do not add "significantly more" to the abstract radio network of the claim because they are not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, "updating" and "modifying" link trees are well-understood, routine, and conventional activities, as shown and described throughout the prior art claim charts included in these responses.
18. A wireless network system as	The asserted dependent patent claim is patent-ineligible as a matter of law under 35

The '471 Patent – Claims	Reasons for Patent Ineligibility
recited in claim 17, wherein at least one of the second nodes is a mobile device and said first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and logic dynamically updating said second node link tree when said comparison meets predetermined conditions.	U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny

The '471 Patent – Claims	Reasons for Patent Ineligibility
	because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
19. A wireless network system as recited in claim 18 wherein said first node process further comprises: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; and logic inserting one of the plurality of said second nodes in said second node link tree if one of the plurality of said second nodes is authentic and is not already in said second node link tree.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining" and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link

The '471 Patent – Claims	Reasons for Patent Ineligibility
	tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.
20. A wireless system comprising: a first node implementing a first node process including receiving data packets via a first node wireless radio, sending data packets via said wireless radio, communicating with a network, and performing node link tree housekeeping functions; a plurality of second nodes, each second node implementing a second node process including sending and receiving data packet via a second node wireless radio, maintaining a	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "nodes," "housekeeping functions," and "wireless radio") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "nodes." They are said to include a generic "process," but does not specify any structures that improve the wireless communication. Instead, the

The '471 Patent – Claims	Reasons for Patent Ineligibility
send/receive data buffer in a digital memory, and	processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients, e.g., and any wireless transmissions of any data. They do not recite improvements to node structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communications between nodes. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same nodes. The core of what the claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
selecting a link to said first node that	The "selecting" limitation fails to recite anything more than an abstraction. The

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '471 Patent – Claims	Reasons for Patent Ineligibility
is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and	claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the link is "one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every link must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
the first node process further comprises maintaining a second node link tree having second node link entries, dynamically updating the tree to reflect the current operational status of the nodes, and rerouting data packets around inactive or malfunctioning nodes.	The "maintaining," "updating" and "rerouting" clauses are abstract. It adds a process "maintaining a second node link tree having second node link entries, dynamically updating the tree to reflect the current operational status of the nodes, and rerouting data packets around inactive or malfunctioning nodes." For example, it is not expressed how the link tree is "maintained" or "updated" or how data packets are "rerouted," for example, rendering the language abstract.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '471 Patent – Claims	Reasons for Patent Ineligibility
	Moreover, in a network environment, processes that "update" and "modify" link trees and that "reroute"data packets are common. Thus, the clauses are abstract in general because their characteristics are not described, and are abstract in particular because they are in no way implemented in the claim. The "maintaining," "updating" and "rerouting" clauses do not add "significantly more" to the abstract radio network of the claim because they are not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, "maintaining," "updating" and "rerouting" are well-understood, routine, and conventional activities, as shown and described throughout the prior art claim charts included in these responses.
21. A wireless system as recited in claim 20, wherein the first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and logic dynamically updating said second node link tree when said comparison meets predetermined conditions.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics

The '471 Patent – Claims	Reasons for Patent Ineligibility
	are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
22. A wireless system as recited in claim 21, wherein the first node process further includes: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining," "deleting," and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic

The '471 Patent – Claims	Reasons for Patent Ineligibility
already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; logic deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is already in said second node link tree; and logic inserting one of the plurality of said second nodes in said second node link tree if said second node is authentic.	entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.

The '471 Patent – Claims	Reasons for Patent Ineligibility
31. A wireless system comprising: a first node implementing a first node process including receiving data packets via a first node wireless radio, sending data packets via said wireless radio, and communicating with a network; a plurality of second nodes, each second node implementing a second node process including sending and receiving data packet via a second node wireless radio, maintaining a send/receive data buffer in a digital memory, and	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "nodes," "housekeeping functions," and "wireless radio") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "nodes." They are said to include a generic "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients, e.g., and any wireless transmissions of any data. They do not recite improvements to node structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in

The '471 Patent – Claims	Reasons for Patent Ineligibility
	monopolization of the entire field of radio communications between nodes. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same nodes. The core of what the claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
selecting a link to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the link is "one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every link must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '471 Patent – Claims	Reasons for Patent Ineligibility
	boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
the first node process further comprises maintaining a second node link tree having second node link entries.	The "second node link tree" clause is abstract. It adds "maintaining a second node link tree having second node link entries," which does not add any meaningful limitation to a tree due to the abstract nature of "entries." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
32. A wireless system as recited in claim 31, wherein the first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison

The '471 Patent – Claims	Reasons for Patent Ineligibility
logic updating said second node link tree when said comparison meets predetermined conditions.	or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
33. A wireless system as recited in	The asserted dependent patent claim is patent-ineligible as a matter of law under 35

The '471 Patent – Claims	Reasons for Patent Ineligibility
claim 32, wherein the first node process further includes: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; logic deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is already in said second node link tree; and logic inserting one of the plurality of said second nodes in said second node link tree if said second node is authentic.	U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining," "deleting," and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '471 Patent – Claims	Reasons for Patent Ineligibility
	original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.
34. A method for providing wireless network communication comprising: providing a first node implementing a first node process including receiving data packets via R.F. transmission and sending data packets via R.F. transmission; providing a plurality of second nodes, each second node providing a second node process including sending and receiving data packet via R.F. transmission, maintaining a send/receive data buffer in digital memory, and	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "node" and "R.F. transmission") to communicate. With regard to the steps, there is no improvement identified with respect to the structure of the "nodes." It is said to include a generic "process," but does not specify any steps that improve the node. Instead, the node simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to nodes and is nothing more than abstraction of a generic radio communication in a wireless environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any nodes with processes making any transmissions of any data. They do not recite improvements to wireless communication structures. Further these elements are known in the art, and are

The '471 Patent – Claims	Reasons for Patent Ineligibility
	admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communication with nodes. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic nodes. The core of what the claim is doing is the abstract idea of data networking through using nodes. The claim is patent ineligible under §101.
selecting a transmission path to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes" does not save the claim from abstraction because "direct" or "indirect" are

The '471 Patent – Claims	Reasons for Patent Ineligibility
	exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
maintaining a second node link tree having second node link entries at the first node.	The "second node link tree" clause is abstract. It adds "maintaining a second node link tree having second node link entries at the first node," which does not add any meaningful limitation to a tree due to the abstract nature of "entries." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
35. A method as recited in claim 34, wherein said first node process	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim.

The '471 Patent – Claims	Reasons for Patent Ineligibility
further includes: comparing a selected link from one of the plurality of said second nodes to said first node to a second node link entry in said second node link tree; and updating said second node link tree when said comparison meets at least one of several predetermined conditions.	This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients

The '471 Patent – Claims	Reasons for Patent Ineligibility
	communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
36. A method as recited in claim 34, wherein said first node process further includes: determining if one of the plurality of said second nodes is authentic; deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is already in said second node link tree; and inserting one of the plurality of said second nodes in said second node tree if said second node is authentic.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining," "deleting," and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link

The '471 Patent – Claims	Reasons for Patent Ineligibility
	tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.
40. In a network including a plurality of client nodes having a client radio modem and a client controller which implements a client process including receiving and transmitting data packets via said client node to other nodes in the network, a server node comprising: a server node radio modem; and a server node controller implementing a server process,	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server node," "client nodes," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server node" or "client node." It is said to include a generic "controller" and a generic "radio modem," but does not specify any structures that

The '471 Patent – Claims	Reasons for Patent Ineligibility
	improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers and radio communications and is nothing more than abstraction of a generic radio communication in a gateway environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients with any controllers and any radios making any transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.

The '471 Patent – Claims	Reasons for Patent Ineligibility
said server process configured to: receive selected transmission paths from each of the plurality of client nodes, wherein said transmission path is one of a direct link to the server node and an indirect link to said server node through at least one other client node; determine an optimized transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes; and send the optimized transmission path for each of the plurality of client nodes to the respective client node.	The "server process" clause is abstract. It adds that the server process is configured to "receive selected transmission paths from each of the plurality of client nodes…," to "determine an optimized transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes," and to "send the optimized transmission path for each of the plurality of client nodes to the respective client node." Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "optimized" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "optimization." Moreover, in a network environment, processes that update a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed "sending" process. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, creating and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The recitation that the path is "one of a direct link to the server node and an indirect link to said server node through at least one other client node" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites

The '471 Patent – Claims	Reasons for Patent Ineligibility
	such that every path must be one or the other. That recitation is the height of abstraction. Further, the presence of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time making it no option at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available then the recitation is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract network may be implemented.
41. The server node of claim 40, wherein the server process is further configured to perform gateway functions.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. In addition, performing "gateway functions" does not add "significantly more" to the abstract radio network of the claim. Further, that gateway functions is abstract concept and, at most, are well-understood, routine, and conventional activities, as shown and described throughout the prior art claim charts included in these responses.

Invalidity Chart for U.S. Patent No. 8,625,496

The '496 Patent – Claims	Reasons for Patent Ineligibility
1. A wireless network system comprising: a server including a server controller and a server radio modem, said server controller implementing a server process that includes the control of said server radio modem, said server process including the receipt and transmission of data packets via said server radio modem; a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes the control of said client radio modem, said client process including the receipt and transmission of data packets via said client radio modem,	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "gateway," "clients," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." It is said to include a generic "controller" and a generic "radio modem," but does not specify any structures that improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers and radio communications and is nothing more than abstraction of a generic radio communication in a gateway environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients with any controllers and any radios making any transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses).

The '496 Patent – Claims	Reasons for Patent Ineligibility
	Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients; and	The "initiates and selects" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "one of a direct link to said server and an indirect link to said server" does not save the claim from abstraction because "one of a direct link to said server and an indirect link to said server" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
	always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
wherein the server process is configured to: receive information identifying the selected transmission path from each of the plurality of clients; determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients; send information identifying the server selected transmission path for each of the clients to the respective clients; and maintain a client link tree having client link entries representing each of the plurality of clients.	The "server process" clause is abstract. It adds that the server process is configured to "receive information identifying the selected transmission path from each of the plurality of clients," to "determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients," to "send information identifying the server selected transmission path for each of the clients to the respective clients," and to "maintain a client link tree having client link entries representing each of the plurality of clients." Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "selected" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "selected." Moreover, in a network environment, processes that update a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed "sending" process. "[M]aintaining a client link tree having client link entries representing each of the plurality of clients" does not add any meaningful limitation to a tree due to the abstract nature of "entries." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is

The '496 Patent – Claims	Reasons for Patent Ineligibility
	in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, determining, maintaining, and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
2. A wireless network system comprising: a server including a server controller and a server radio modem, said server controller implementing a server process that includes the control of said server radio modem, said server process including the receipt and transmission of data packets via said server radio modem; and a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes the control of said client radio modem, said client process including the receipt and transmission of data packets via said client radio	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "clients," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." It is said to include a generic "controller" and a generic "radio modem," but does not specify any structures that improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers and radio communications and is nothing more than abstraction of a generic packet radio communication in a networked environment. The claimed networking elements do not provide "significantly more" as *Alice*

The '496 Patent – Claims	Reasons for Patent Ineligibility
modem,	requires. These elements are merely any servers and any clients with any controllers and any radios making any transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said	The "initiates and selects" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur.

The '496 Patent – Claims	Reasons for Patent Ineligibility
server through at least one the remainder of said plurality of clients,	The recitation that the path is "one of a direct link to said server and an indirect link to said server" does not save the claim from abstraction because "one of a direct link to said server and an indirect link to said server" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
wherein said server process further includes logic that maintains a client link tree having client link entries representing each of the plurality of clients,	The "client link tree" clause is abstract. It adds "a client link tree having client link entries," and further recites "representing each of the plurality of clients," which does not add any meaningful limitation to a tree or its entries due to the abstract nature of "representing." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.

The '496 Patent – Claims	Reasons for Patent Ineligibility
and wherein the server process is configured to: receive information identifying the selected transmission path from each of the plurality of clients, determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, and send information identifying the server selected transmission path for each of the clients to the respective clients.	The "server process" clause is abstract. It adds that the server process is configured to "receive information identifying the selected transmission path from each of the plurality of clients," to "determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients," and to "send information identifying the server selected transmission path for each of the clients to the respective clients." Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "selected" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "selected." Moreover, in a network environment, processes that update a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed "sending" process. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, determining, maintaining, and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
3. A wireless network system as recited in claim 2, wherein said server process is further configured to:	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim.

The '496 Patent – Claims	Reasons for Patent Ineligibility
compare a selected link from said client to said server to a current client link entry in said client link tree; and update said client link tree when said comparison meets predetermined conditions.	This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client

The '496 Patent – Claims	Reasons for Patent Ineligibility
	link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
4. A wireless network system as recited in claim 2, wherein said server process is further configured to: determine if said client is authentic; determine if said client is already in said client link tree if said client is determined to be authentic; delete said client from said client link tree if said client is authentic and is already in said client link tree; and insert said client in said client link tree if said client is authentic and is not already in said client link tree.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining," "deleting," and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with

The '496 Patent – Claims	Reasons for Patent Ineligibility
	respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.
5. The wireless network system of claim 2, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. The claim adds that the "client link entries correspond to the server selected transmission path between the server and the respective client," which does not add "significantly more" to the abstract radio network, particularly due to the vague reference to "correspond." In a network environment, processes that update a network map are common. Thus, the recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Moreover, the "server selected" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, maintaining an

The '496 Patent – Claims	Reasons for Patent Ineligibility
	updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
7. A wireless network system comprising: a server providing a server process including receiving data packets via a server wireless communication, sending data packets via said wireless communication, communicating with a network, and performing housekeeping functions; and a plurality of clients, each client providing a client process including sending and receiving data packet via a client wireless communication, maintaining a send/receive data buffer in digital memory, and	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "housekeeping functions," "clients," and "wireless communication") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." They are said to include a generic "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients and any wireless transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses).

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
	Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction.

The '496 Patent – Claims	Reasons for Patent Ineligibility
	Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
wherein said server process further comprises maintaining a client link tree having client link entries representing each of the plurality of clients,	The "client link tree" clause is abstract. It adds "a client link tree having client link entries," and further recites "representing each of the plurality of clients," which does not add any meaningful limitation to a tree or its entries due to the abstract nature of "representing." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
and wherein the server process is configured to: receive information identifying the selected transmission path from each of the plurality of clients,	The "server process" clause is abstract. It adds that the server process is configured to "receive information identifying the selected transmission path from each of the plurality of clients," to "determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients," to "update the client link entries to provide the server selected

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the server selected transmission path, and send information identifying the server selected transmission path for each of the clients to the respective clients.	transmission path," and to "send information identifying the server selected transmission path for each of the clients to the respective clients." Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "selected" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "selected." Moreover, in a network environment, processes that update a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed "sending" process. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, determining, maintaining, and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
8. A wireless network system as recited in claim 7, wherein said server process is further configured to: compare a selected link from said client to said server to a current client link entry in said client link tree; and update said client link tree when said	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept.

The '496 Patent – Claims	Reasons for Patent Ineligibility
comparison meets predetermined conditions.	The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
9. A wireless network system as recited in claim 7, wherein said server process is further configured to: determine if said client is authentic; determine if said client is already in said client link tree if client is determined to be authentic; delete said client from said client link tree if said client is authentic and is already in said client link tree; and insert said client in said client link tree if said client is authentic and is not already in said client link tree.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining," "deleting," and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of

The '496 Patent – Claims	Reasons for Patent Ineligibility
	new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.
10. The wireless network system of claim 7, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. The claim adds that the "client link entries correspond to the server selected transmission path between the server and the respective client.," which does not add "significantly more" to the abstract radio network, particularly due to the vague reference to "correspond." In a network environment, processes that update a network map are common. Thus, the recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Moreover, the "server selected" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, maintaining an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
11. A method for providing wireless network communication comprising: utilizing a server implementing a server process including receiving data packets via RF transmission, sending data packets via RF transmission, communicating with a network, and performing housekeeping functions; and utilizing a plurality of clients, each client providing a client process including sending and receiving data packet via RF transmission, maintaining a send/receive data buffer in digital memory, and	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "housekeeping functions," "clients," and "wireless network communication") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." They are said to include a generic "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients and any wireless transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server.

The '496 Patent – Claims	Reasons for Patent Ineligibility
	Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is

The '496 Patent – Claims	Reasons for Patent Ineligibility
	illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
wherein the server process: receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, sends information identifying the server selected transmission path for each of the clients to the respective clients; and	The "server process" clause is abstract. It adds that the server process "receives information identifying the selected transmission path from each of the plurality of clients," "determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients," and "sends information identifying the server selected transmission path for each of the clients to the respective clients." Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "selected" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "selected." Moreover, in a network environment, processes that update a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed "sending" process. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, determining, maintaining, and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim

The '496 Patent – Claims	Reasons for Patent Ineligibility
	charts included in these responses.
maintains a client link tree having client link entries representing each of the plurality of clients.	The "client link tree" clause is abstract. It adds "a client link tree having client link entries," and further recites "representing each of the plurality of clients," which does not add any meaningful limitation to a tree or its entries due to the abstract nature of "representing." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
12. A method for providing wireless network communication comprising: utilizing a server implementing a server process including receiving data packets via RF transmission, sending data packets via RF transmission, communicating with a network, and performing housekeeping functions; and utilizing a plurality of clients, each client providing a client process including sending and receiving data	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "housekeeping functions," "clients," and "wireless network communication") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." They are said to include a generic "process,"

The '496 Patent – Claims	Reasons for Patent Ineligibility
packet via RF transmission, maintaining a send/receive data buffer in digital memory, and	but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients and any wireless transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.

The '496 Patent – Claims	Reasons for Patent Ineligibility
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
wherein said server process further includes maintaining a client link tree having client link entries representing each of the plurality of clients, and wherein the server process:	The "client link tree" clause is abstract. It adds "a client link tree having client link entries," and further recites "representing each of the plurality of clients," which does not add any meaningful limitation to a tree or its entries due to the abstract nature of "representing." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
	The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the server selected transmission path, and sends information identifying the server selected transmission path for each of the clients to the respective clients.	The "server process" clause is abstract. It adds that the server process "receives information identifying the selected transmission path from each of the plurality of clients," "determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients," "updates the client link entries to provide the server selected transmission path," and "sends information identifying the server selected transmission path for each of the clients to the respective clients." Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "selected" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "selected." Moreover, in a network environment, processes that update a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed "sending" process. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, determining, maintaining, and distributing an updated network map is a well-understood, routine,

The '496 Patent – Claims	Reasons for Patent Ineligibility
	and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
13. A method as recited in claim 12, wherein said server process further includes: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout

The '496 Patent – Claims	Reasons for Patent Ineligibility
	the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
14. A method as recited m claim 12, wherein said server process further includes: determining is said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is authentic and is already in said client link tree; and inserting said client in said client link tree if said client is authentic and is not already in said client link tree.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining," "deleting," and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
	ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.
15. The method of claim 12, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. The claim adds that the "client link entries correspond to the server selected transmission path between the server and the respective client," which does not add "significantly more" to the abstract radio network, particularly due to the vague reference to "correspond." In a network environment, processes that update a

The '496 Patent – Claims	Reasons for Patent Ineligibility
	network map are common. Thus, the recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Moreover, the "server selected" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, maintaining an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
16. A method for providing wireless network communication comprising the steps of: a server process including a data packet reception step, a data packet transmission step, a network communication step, and a housekeeping step; and a plurality of clients each providing a client process including a data sending and receiving step, a send and receive data buffer maintenance step, and	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "housekeeping step," "clients," and "data packet transmission") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." They are said to include a generic "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication.

The '496 Patent – Claims	Reasons for Patent Ineligibility
	The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients and any wireless transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
a transmission path selection step wherein the transmission path is one of a direct link to a server and an indirect link to said server through at	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
least one of the remainder of said plurality of clients,	The recitation that the path is "one of a direct link to a server and an indirect link to said server through at least one of the remainder of said plurality of clients" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
wherein the server process: receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, sends information identifying the server selected transmission path for	The "server process" clause is abstract. It adds that the server process "receives information identifying the selected transmission path from each of the plurality of clients," "determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients," and "sends information identifying the server selected transmission path for each of the clients to the respective clients." Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "selected" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "selected." Moreover, in a network

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
each of the clients to the respective clients; and	environment, processes that update a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed "sending" process. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, determining, maintaining, and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
maintains a client link tree having client link entries representing each of the plurality of clients.	The "client link tree" clause is abstract. It adds "a client link tree having client link entries," and further recites "representing each of the plurality of clients," which does not add any meaningful limitation to a tree or its entries due to the abstract nature of "representing." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
17. A method for providing wireless	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101

The '496 Patent – Claims	Reasons for Patent Ineligibility
network communication comprising the steps of: a server process including a data packet reception step, a data packet transmission step, a network communication step, and a housekeeping step; and a plurality of clients each providing a client process including a data sending and receiving step, a send and receive data buffer maintenance step, and	of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "housekeeping step," "clients," and "data packet transmission") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." They are said to include a generic "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients and any wireless transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent.

The '496 Patent – Claims	Reasons for Patent Ineligibility
	The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
a link selection step wherein the transmission path is one of a direct link to a server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the link is "one of a direct link to a server and an indirect link to said server through at least one of the remainder of said plurality of clients" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every link must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
	abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
wherein said server process further comprises the step of maintaining a client link tree having client link entries representing each of the plurality of clients, and	The "client link tree" clause is abstract. It adds "a client link tree having client link entries," and further recites "representing each of the plurality of clients," which does not add any meaningful limitation to a tree or its entries due to the abstract nature of "representing." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
wherein the server process: receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the server selected	The "server process" clause is abstract. It adds that the server process "receives information identifying the selected transmission path from each of the plurality of clients," "determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients," "updates the client link entries to provide the server selected transmission path," and "sends information identifying the server selected transmission path for each of the clients to the respective clients." Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "selected" transmission paths are "determined," for example, rendering the language

The '496 Patent – Claims	Reasons for Patent Ineligibility
transmission path, and sends information identifying the server selected transmission path for each of the clients to the respective clients.	abstract, particularly due to the abstract nature of "selected." Moreover, in a network environment, processes that update a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed "sending" process. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, determining, maintaining, and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
18. A method as recited m claim 17, wherein said server process further comprises the steps of: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
	table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
19. A method as recited in claim 17, wherein said server process further comprises steps of: determining if said client is authentic; determining if said client is already in said client link tree if client is	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining," "deleting," and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and

The '496 Patent – Claims	Reasons for Patent Ineligibility
determined to be authentic; deleting said client from said client link tree if said client is authentic and is already in said client link tree; and inserting said client into said client link tree if said client is authentic and is not already in said client link tree.	deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is

The '496 Patent – Claims	Reasons for Patent Ineligibility
	the abstract idea of radio communications and networking. It is patent ineligible under §101.
20. The method of claim 17, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. The claim adds that the "client link entries correspond to the server selected transmission path between the server and the respective client," which does not add "significantly more" to the abstract radio network, particularly due to the vague reference to "correspond." In a network environment, processes that update a network map are common. Thus, the recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Moreover, the "server selected" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, maintaining an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
21. A wireless network system comprising: a first node including a first node controller and a first node radio modem, said first node controller	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing

The '496 Patent – Claims	Reasons for Patent Ineligibility
implementing a first node process that includes controlling of said first node radio modem, said first node process including receiving and transmitting data packets via said first node radio modem; a plurality of second nodes each including a second node controller implementing a second node process that includes controlling a second node radio modem, said second node process including receiving and transmitting data packets via said second node radio modem,	generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "node" and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "nodes." It is said to include a generic "controller" and a generic "radio modem," but does not specify any structures that improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers and radio communications and is nothing more than abstraction of a generic radio communication in a wireless environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any nodes with any controllers and any radios making any transmissions of any data. They do not recite improvements to wireless communication structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communication with nodes. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes.

The '496 Patent – Claims	Reasons for Patent Ineligibility
	Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic nodes. The core of what the claim is doing is the abstract idea of data networking through using nodes. The claim is patent ineligible under §101.
wherein said second node process of each of said second nodes includes initiating a radio transmission path to said first node that is a link to said first node through at least one of the remainder of said plurality of second nodes,	The "initiating" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "a link to said first node through at least one of the remainder of said plurality of second nodes" does not save the claim from abstraction because it merely recites that the second nodes have an indirect channel of communication. Further, the "initiation" of an indirect communication path does not add significantly more because it merely encompass typical packet radio communications, and is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
wherein said first node process dynamically updates a second node link tree comprising second node link entries representing each of the plurality of second nodes and dynamically modifies the second node	The "updating" and "modifying" clauses are abstract. It adds a process that "dynamically updates a second node link tree comprising second node link entries and dynamically modifies the second node link tree so that the data packet transmission from the first node is optimized." For example, it is not expressed how the link tree is "updated" or "modified," for

The '496 Patent – Claims	Reasons for Patent Ineligibility
link tree so that the data packet transmission path to the first node is optimized.	example, rendering the language abstract, particularly due to the abstract nature of "optimized." Moreover, in a network environment, processes that "update" and "modify" link trees are common. Thus, the clauses are abstract in general because their characteristics are not described, and are abstract in particular because they are in no way implemented in the claim. The "updating" and "modifying" recitations do not add "significantly more" to the abstract radio network of the claim because they are not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, "updating" and "modifying" link trees are well-understood, routine, and conventional activities, as shown and described throughout the prior art claim charts included in these responses.
22. A wireless network system as recited in claim 21, wherein at least one of the second nodes is a mobile device and said first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and logic dynamically updating said second node link tree when said	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present

The '496 Patent – Claims	Reasons for Patent Ineligibility
comparison meets predetermined conditions.	recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
23. A wireless network system as recited in claim 21, wherein said first node process further comprises: logic determining if one of the plurality of said second nodes is	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining" and "inserting," relating to entries in link tree. These steps are routine database type operations,

The '496 Patent – Claims	Reasons for Patent Ineligibility
authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; and logic inserting one of the plurality of said second nodes in said second node link tree if one of the plurality of said second nodes is authentic and is not already in said second node link tree.	namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is

The '496 Patent – Claims	Reasons for Patent Ineligibility
	the abstract idea of radio communications and networking. It is patent ineligible under §101.
24. In a wireless system comprising a plurality of second nodes, each second node implementing a second node process including sending and receiving data packet via a second node wireless radio, maintaining a send/receive data buffer in a digital memory, and	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "nodes," "buffer," and "process") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "nodes." They are said to include a generic "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients, e.g., and any wireless transmissions of any data. They do not recite improvements to node structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this

The '496 Patent – Claims	Reasons for Patent Ineligibility
	case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communications between nodes. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same nodes. The core of what the claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
selecting a link to a first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes,	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the link is "one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every link must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are

The '496 Patent – Claims	Reasons for Patent Ineligibility
	always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
a first node configured to implement a first node process, the first node process including: receiving data packets via a first node wireless radio; sending data packets via said wireless radio; communicating with a network; performing node link tree housekeeping functions;	The clause is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "nodes," "housekeeping functions," and "wireless radio") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "nodes." They are said to include a generic "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients, e.g., and any wireless transmissions of any data. They do not recite improvements to node structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses).

The '496 Patent – Claims	Reasons for Patent Ineligibility
	Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communications between nodes. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same nodes. The core of what the claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
maintaining a second node link tree having second node link entries representing each of the plurality of second nodes; dynamically updating the tree to reflect the current operational status of the second nodes; and rerouting data packets around inactive or malfunctioning second nodes.	The "maintaining," "updating" and "rerouting" clauses are abstract. It adds a process "maintaining a second node link tree having second node link entries representing each of the plurality of second nodes; dynamically updating the tree to reflect the current operational status of the second nodes; and rerouting data packets around inactive or malfunctioning second nodes.." For example, it is not expressed how the link tree is "maintained" or "updated" or how data packets are "rerouted," for example, rendering the language abstract. Moreover, in a network environment, processes that "update" and "modify" link trees and that "reroute"data packets are common. Thus, the clauses are abstract in general

The '496 Patent – Claims	Reasons for Patent Ineligibility
	because their characteristics are not described, and are abstract in particular because they are in no way implemented in the claim. The "maintaining," "updating" and "rerouting" clauses do not add "significantly more" to the abstract radio network of the claim because they are not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, "maintaining," "updating" and "rerouting" are well-understood, routine, and conventional activities, as shown and described throughout the prior art claim charts included in these responses.
25. The first node of claim 24, wherein the first node process further includes: comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and dynamically updating said second node link tree when said comparison meets predetermined conditions.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims.

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
	The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
26. The first node of claim 24, wherein the first node process further includes: determining if one of the plurality of said second nodes is authentic; determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic;	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining," "deleting," and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract.

The '496 Patent – Claims	Reasons for Patent Ineligibility
deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is authentic and is already in said second node link tree; and inserting one of the plurality of said second nodes in said second node link tree if said second node is authentic and is not already in said client link tree.	The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.

The '496 Patent – Claims	Reasons for Patent Ineligibility
27. In a wireless system comprising a plurality of second nodes and a first node configured to implement a first node process, the first node process including receiving data packets via a first node wireless radio, sending data packets via said wireless radio, communicating with a network, performing node link tree housekeeping functions,	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "nodes," "housekeeping functions," and "wireless radio") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "nodes." It is said to include a generic "process" and a generic "wireless radio," but does not specify any structures that improve the process or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication in a wireless environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any nodes with any processes and any radios making any transmissions of any data. They do not recite improvements to wireless communication structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communication with nodes. Plaintiffs

The '496 Patent – Claims	Reasons for Patent Ineligibility
	should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic nodes. The core of what the claim is doing is the abstract idea of data networking through using nodes. The claim is patent ineligible under §101.
maintaining a second node link tree having second node link entries representing each of the plurality of second nodes, dynamically updating the tree to reflect the current operational status of the second nodes, and rerouting data packets around inactive or malfunctioning second nodes, a second node in the plurality of second nodes,	The "maintaining," "updating" and "rerouting" clauses are abstract. It adds a process "maintaining a second node link tree having second node link entries representing each of the plurality of second nodes, dynamically updating the tree to reflect the current operational status of the second nodes, and rerouting data packets around inactive or malfunctioning second nodes, a second node in the plurality of second nodes." For example, it is not expressed how the link tree is "maintained" or "updated" or how data packets are "rerouted," for example, rendering the language abstract. Moreover, in a network environment, processes that "update" and "modify" link trees and that "reroute"data packets are common. Thus, the clauses are abstract in general because their characteristics are not described, and are abstract in particular because they are in no way implemented in the claim.

The '496 Patent – Claims	Reasons for Patent Ineligibility
	The "maintaining," "updating" and "rerouting" clauses do not add "significantly more" to the abstract radio network of the claim because they are not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, "maintaining," "updating" and "rerouting" are well-understood, routine, and conventional activities, as shown and described throughout the prior art claim charts included in these responses.
the second node configured to implement a second node process including: sending and receiving data packet via a second node wireless radio; maintaining a send/receive data buffer in a digital memory; and	This element only recites the most basic, general radio networking structure including generic terms (such as, "node," "wireless radio," and "buffer") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "second nodes." They are said to include a generic "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients and any wireless transmissions of any data. They do not recite improvements to radio communications structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server.

The '496 Patent – Claims	Reasons for Patent Ineligibility
	Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic nodes. The core of what the claim is doing is the abstract idea of data networking through using nodes. The claim is patent ineligible under §101.
selecting a link to the first node that is one of a direct link to the first node and an indirect link to the first node through at least one of the remainder of the plurality of second nodes.	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the link is "one of a direct link to the first node and an indirect link to the first node through at least one of the remainder of the plurality of second nodes" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every link must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is

The '496 Patent – Claims	Reasons for Patent Ineligibility
	illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
33. In a wireless network system comprising a plurality of second nodes each including a second node controller configured to implement a second node process that includes controlling a second node radio modem, receiving and transmitting data packets via said second node radio modem, and	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. This element only recites the most basic, general radio networking structure including generic terms (such as, "node," "controller," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "second nodes." They are said to include a generic "controller" implementing a "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any nodes with any processes and any radios making any transmissions of any data. They do not recite improvements to wireless communication structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional

The '496 Patent – Claims	Reasons for Patent Ineligibility
	activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communication with nodes. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic nodes. The core of what the claim is doing is the abstract idea of data networking through using nodes. The claim is patent ineligible under §101.
initiating a radio transmission path to a first node that is a direct link to said first node through at least one of the remainder of said plurality of second nodes,	The "initiating" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "a direct link to said first node through at least one of the remainder of said plurality of second nodes" does not save the claim from abstraction because it merely recites that the second nodes have an indirect channel of communication. Further, the "initiation" of an indirect communication path does

The '496 Patent – Claims	**Reasons for Patent Ineligibility**
	not add significantly more because it merely encompass typical packet radio communications, and is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
the first node comprising: a first node controller; and a first node radio modem, wherein said first node controller is configured to implement a first node process comprising: controlling said first node radio modem; receiving and transmitting data packets via said first node radio modem; and	This element only recites the most basic, general radio networking structure including generic terms (such as, "nodes," "controller," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "first node." They are said to include a generic "controller" implementing a "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any nodes and any wireless transmissions of any data. They do not recite improvements to radio communications structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses).
maintaining a second node link tree comprising second node link entries representing each of the plurality of second nodes.	The "second node link tree" clause is abstract. It adds "maintaining a second node link tree comprising second node link entries representing each of the plurality of second nodes," which does not add any meaningful limitation to a tree due to the abstract nature of "entries." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way

The '496 Patent – Claims	Reasons for Patent Ineligibility
	implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
34. A wireless network system as recited in claim 33, wherein said first node process further comprises: comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and updating said second node link tree when said comparison meet predetermined conditions.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
	because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
35. A wireless network system as recited in claim 33, wherein said first node process further comprises: determining if one of the plurality of said second nodes is authentic; determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; and inserting one of the plurality of said second nodes in said second node link	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claims add manipulations to a link tree, such as "determining" and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
tree if one of the plurality of said second nodes is authentic and is not already in said client link tree.	data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.
36. In a wireless network system comprising a plurality of second nodes and a first node, the first node	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act.

The '496 Patent – Claims	Reasons for Patent Ineligibility
comprising a first node controller and a first node radio modem, wherein said first node controller is configured to implement a first node process that includes controlling said first node radio modem, receiving and transmitting data packets via said first node radio modem, and	The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim element only recites the most basic, general radio networking structure including generic terms (such as, "nodes," "controller," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "first node." It is said to include a generic "controller" implementing a "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any nodes and any wireless transmissions of any data. They do not recite improvements to radio communications structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communication with nodes. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry

The '496 Patent – Claims	Reasons for Patent Ineligibility
	because they are all directed to routine, conventional activity for sending radio transmissions through nodes. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic nodes. The core of what the claim is doing is the abstract idea of data networking through using nodes. The claim is patent ineligible under §101.
maintaining a second node link tree comprising second node link entries representing each of the plurality of second nodes, at least one second node in the plurality of second nodes comprising:	The "second node link tree" clause is abstract. It adds "maintaining a second node link tree comprising second node link entries representing each of the plurality of second nodes," which does not add any meaningful limitation to a tree due to the abstract nature of "entries." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
a second node controller configured to implement a second node process that includes controlling a second node radio modem, receiving and transmitting data packets via said	This element only recites the most basic, general radio networking structure including generic terms (such as, "node," "controller," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to

The '496 Patent – Claims	Reasons for Patent Ineligibility
second node radio modem,	the structure of the "second nodes." They are said to include a generic "controller" implementing a "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any nodes with any processes and any radios making any transmissions of any data. They do not recite improvements to wireless communication structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses).
initiating a radio transmission path to a first node that is a direct link to said first node through at least one of the remainder of said plurality of second nodes.	The "initiating" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "a direct link to said first node through at least one of the remainder of said plurality of second nodes" does not save the claim from abstraction because it merely recites that the second nodes have an indirect channel of communication. Further, the "initiation" of an indirect communication path does not add significantly more because it merely encompass typical packet radio communications, and is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.

The '496 Patent – Claims	Reasons for Patent Ineligibility
37. A method for providing wireless network communication comprising: implementing in a first node a first node process including receiving data packets via R.F. transmission and sending data packets via R.F. transmission; implementing in each of a plurality of second nodes a second node process including sending and receiving data packet via R.F. transmission, maintaining a send/receive data buffer in digital memory, and	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "node" and "R.F. transmission") to communicate. With regard to the steps, there is no improvement identified with respect to the structure of the "nodes." It is said to include a generic "process," but does not specify any steps that improve the node. Instead, the node simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to nodes and is nothing more than abstraction of a generic radio communication in a wireless environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any nodes with processes making any transmissions of any data. They do not recite improvements to wireless communication structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communication with nodes. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent.

The '496 Patent – Claims	Reasons for Patent Ineligibility
	The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic nodes. The core of what the claim is doing is the abstract idea of data networking through using nodes. The claim is patent ineligible under §101.
selecting a transmission path to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and	The "selecting" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
	from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.
maintaining a second node link tree having second node link entries representing each of the plurality of second nodes at the first node.	The "second node link tree" clause is abstract. It adds "maintaining a second node link tree having second node link entries representing each of the plurality of second nodes at the first node," which does not add any meaningful limitation to a tree due to the abstract nature of "entries." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
38. A method as recited in claim 37, wherein said first node process further includes: comparing a selected link from one of the plurality of said second nodes to said first node to a second node link entry in said second node link tree; and updating said second node link tree	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. This claim adds comparing a link to an entry in the link tree and updating the tree. Comparing selected entries against existing tables and updating the table based on the comparison is an abstract database concept. The claims are not directed to any specific improvement in the tree or the comparison or updating operations. They simply define the abstract comparison and update

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
when said comparison meets at least one of several predetermined conditions.	generically, particularly with regard to the vague concept of "predetermined conditions." It should be noted that the client link tree was not said to operate in any manner and were not used in any operative way in the base claim. Thus, the present recitation of "comparing" and "updating" has no further significance beyond abstract table operations since the table has no operative effect in either the base claims or this dependent one. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The client link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That they are compared and updated is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions using an updated client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. The claim is patent ineligible under §101.
39. A method as recited in claim 37, wherein said first node process	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim.

The '496 Patent – Claims	Reasons for Patent Ineligibility
further includes: determining if one of the plurality of said second nodes is authentic; deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is authentic and is already in said second node link tree; and inserting one of the plurality of said second nodes in said second node tree if said second node is authentic and is not already in said client link tree.	This claims add manipulations to a link tree, such as "determining," "deleting," and "inserting," relating to entries in link tree. These steps are routine database type operations, namely verifying table entries, checking for duplicate table entries, and deleting and adding table entries. The claims do not indicate that these operations are novel or unique beyond their abstract data table operations. Comparing authentic entries against existing tables and updating the table based on the authentication is abstract. The claims are not directed to any specific improvement in the tables or the authentication or modification operations. They simply define the abstract use of a data table generically. These claims add no more detail to how the link trees are operational within the whole system. Thus, the present recitations of "authenticating," etc. have no further significance beyond abstract table operations since the tabled have no operative effect in either the base claims or these dependent ones. The tree remains abstract in general because its characteristics are not described, and abstract in particular because it is in no way implemented in the claims. The elements of the dependent claims also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional data table operations. The link tree recitations themselves add nothing more to the abstraction, as described with respect to the base claims. That potential entries are authenticated, added and deleted is no more than the original data tree abstraction. The maintenance of data entries is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The comparison of new links and the updating of a table based thereon are nothing more than the original abstract table maintenance.

The '496 Patent – Claims	Reasons for Patent Ineligibility
	Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic radio communications network using an updated/maintained client link tree. The core of what this claim is doing is the abstract idea of radio communications and networking. It is patent ineligible under §101.
40. In a network including a plurality of client nodes having a client radio modem and a client controller which implements a client process including receiving and transmitting data packets via said client node to other nodes in the network, a server node comprising: a server node radio modem; and a server node controller implementing a server process,	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The claim only recites the most basic, general radio networking structure including generic terms (such as, "server node," "client nodes," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server node" or "client node." It is said to include a generic "controller" and a generic "radio modem," but does not specify any structures that improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers and radio communications and is nothing more than abstraction of a generic radio communication in a gateway environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients with any controllers

The '496 Patent – Claims	Reasons for Patent Ineligibility
	and any radios making any transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server. Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
said server process configured to: receive information identifying selected transmission paths from each of the plurality of client nodes, wherein said transmission path is one of a direct link to the server node and	The "server process" clause is abstract. It adds that the server process is configured to "receive information identifying selected transmission paths from each of the plurality of client nodes," "determine a server selected transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes," "send information identifying the server selected transmission path for each of the plurality of client nodes to the respective client

The '496 Patent – Claims	Reasons for Patent Ineligibility
an indirect link to said server node through at least one other client node; determine a server selected transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes; send information identifying the server selected transmission path for each of the plurality of client nodes to the respective client node; and maintain a client link tree having client link entries representing each of the plurality of client nodes.	node," and "maintain a client link tree having client link entries representing each of the plurality of client nodes." Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "selected" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "selected." Moreover, in a network environment, processes that update a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed "sending" process. "[M] aintain a client link tree having client link entries representing each of the plurality of client nodes" does not add any meaningful limitation to a tree due to the abstract nature of "entries." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, determining, maintaining, and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses. The recitation that the path is "one of a direct link to the server node and an indirect link to said server node through at least one other client node" does not save the claim from abstraction because "direct" or "indirect" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of

The '496 Patent – Claims	Reasons for Patent Ineligibility
	abstraction. Further, the presence of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time making it no option at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available then the recitation is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract network may be implemented.
41. The server node of claim 40, wherein the server process is further configured to perform gateway functions.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. In addition, performing "gateway functions" does not add "significantly more" to the abstract radio network of the claim. Further, that gateway functions is abstract concept and, at most, are well-understood, routine, and conventional activities, as shown and described throughout the prior art claim charts included in these responses.
42. A server for use in a wireless network system including a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map. The

The '496 Patent – Claims	Reasons for Patent Ineligibility
controlling said client radio modem, receiving and transmitting data packets via said client radio modem,	claim only recites the most basic, general radio networking structure including generic terms (such as, "server," "controller," "clients," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." It is said to include a generic "controller" and a generic "radio modem," but does not specify any structures that improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers and radio communications and is nothing more than abstraction of a generic radio communication in a networked environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients with any controllers and any radios making any transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of client path radio communication to a server. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through clients to a server.

The '496 Patent – Claims	Reasons for Patent Ineligibility
	Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than a generic server and generic clients communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic servers and clients. The core of what the claim is doing is the abstract idea of data networking through clients to a server. The claim is patent ineligible under §101.
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients,	The "initiates and selects" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "one of a direct link to said server and an indirect link to said server" does not save the claim from abstraction because "one of a direct link to said server and an indirect link to said server" are exclusive mutual opposites such that every path must be one or the other. That recitation is the height of abstraction. Further, the "selection" of one of the two exclusive mutual opposites is also nothing more than abstraction because (1) if the claim does not require that both options are always available at any one time from which the "selection" is made then the selection boils down to no option (and hence no selection) at all, which is as abstract as it is illogical, (2) if the claim requires both options are always available at any one time from which the "selection" is made then the selection is nothing more than the abstract idea of sending data directly to a destination or through an intermediary. In the latter case, the claim recites nothing about the improvement, value or parameters by which such abstract selection may be implemented.

The '496 Patent – Claims	Reasons for Patent Ineligibility
said server comprising: a server controller and a server radio modem, said server controller implementing a server process that includes the controlling of said server radio modem, receiving and transmitting of data packets via said server radio modem,	This element only recites the most basic, general radio networking structure including generic terms (such as, "server," "controller," "clients," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "server" or "client." It is said to include a generic "controller" and a generic "radio modem," but does not specify any structures that improve the controller or radio modem. Instead, the controller simply communicates data in a well-known manner. Thus, the claim language is ubiquitous to controllers and radio communications and is nothing more than abstraction of a generic radio communication in a networked environment. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any servers and any clients with any controllers and any radios making any transmissions of any data. They do not recite improvements to server or client structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses).
maintaining a client link tree having client link entries representing each of the plurality of clients, and	The "client link tree" clause is abstract. It adds "a client link tree having client link entries," and further recites "representing each of the plurality of clients," which does not add any meaningful limitation to a tree or its entries due to the abstract nature of "representing." Thus, the tree is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The tree recitation does not add "significantly more" to the abstract radio network of

The '496 Patent – Claims	Reasons for Patent Ineligibility
	the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, the maintenance of such a tree is well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
receiving information identifying the selected transmission path from each of the plurality of clients, determining a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, and sending information identifying the server selected transmission path for each of the clients to the respective clients.	The remainder of the "server process" clause is also abstract. It adds that the server process includes "receiving information identifying the selected transmission path from each of the plurality of clients," "determining a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients," and "sending information identifying the server selected transmission path for each of the clients to the respective clients." Receiving data is a well-known concept, and does not add "significantly more" to the abstract radio network. With regard to "determining," it is not expressed how the "selected" transmission paths are "determined," for example, rendering the language abstract, particularly due to the abstract nature of "selected." Moreover, in a network environment, processes that update a network map are common, as is the notification to other nodes of an updated map, as called for in the claimed "sending" process. Thus, the "server process" recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Further, the "server process" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, determining, maintaining, and distributing an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.

The '496 Patent – Claims	Reasons for Patent Ineligibility
44. The server of claim 42, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	The asserted dependent patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act for the reasons stated with regard to its base claim. The claim adds that the "client link entries correspond to the server selected transmission path between the server and the respective client," which does not add "significantly more" to the abstract radio network, particularly due to the vague reference to "correspond." In a network environment, processes that update a network map are common. Thus, the recitation is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. Moreover, the "server selected" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, maintaining an updated network map is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
45. A first node for use in wireless network system including a plurality of second nodes each including a second node controller implementing a second node process that includes controlling a second node radio modem, receiving and transmitting	The asserted patent claim is patent-ineligible as a matter of law under 35 U.S.C. § 101 of the Patent Act. The claim is not directed to any specific improvement that would advance radio network transmissions but instead articulates only the abstract idea of establishing generic communication between generic components using an optimal map.

The '496 Patent – Claims	Reasons for Patent Ineligibility
data packets via said second node radio modem,	The claim element only recites the most basic, general radio networking structure including generic terms (such as, "nodes," "controller," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "first node" or "second node." They are said to include a generic "controller" implementing a "process," but does not specify any structures that improve the wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any nodes and any wireless transmissions of any data. They do not recite improvements to radio communications structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses). Step one of the *Mayo* analysis is clearly satisfied as a matter of law. The claims in this case are directed to an ineligible abstract idea that, if allowed, would result in monopolization of the entire field of radio communication with nodes. Plaintiffs should not be allowed to foreclose this broad area with an abstract patent. The elements of the asserted claim also do not pass step two of the *Alice* inquiry because they are all directed to routine, conventional activity for sending radio transmissions through nodes.

The '496 Patent – Claims	Reasons for Patent Ineligibility
	Even in an ordered combination, the claim elements do not pass Section 101 scrutiny because they describe nothing more than generic nodes communicating generic data via generic radio transmissions. Such communications were known in packet radio networks using the same generic nodes. The core of what the claim is doing is the abstract idea of data networking through using nodes. The claim is patent ineligible under §101.
wherein said second node process of each of said second nodes includes initiating a radio transmission path to said first node that is a link to said first node through at least one of the remainder of said plurality of second nodes,	The "initiating" limitation fails to recite anything more than an abstraction. The claimed selection does not result in communication and, at least under Plaintiffs' implied constructions, are merely a step that must be done for communications to occur. The recitation that the path is "a link to said first node through at least one of the remainder of said plurality of second nodes" does not save the claim from abstraction because it merely recites that the second nodes have an indirect channel of communication. Further, the "initiation" of an indirect communication path does not add significantly more because it merely encompass typical packet radio communications, and is a well-understood, routine, and conventional activity, as shown and described throughout the prior art claim charts included in these responses.
said first node comprising: a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling said first node radio modem, receiving and transmitting data packets via said first	The claim element only recites the most basic, general radio networking structure including generic terms (such as, "nodes," "controller," and "radio modem") to communicate. With regard to the components, there is no improvement identified with respect to the structure of the "first node." It is said to include a generic "controller" implementing a "process," but does not specify any structures that improve the

Exhibit B101 – Invalidity Chart for Brownrigg Family Based on 35 U.S.C. § 101 Patent Eligibility

The '496 Patent – Claims	Reasons for Patent Ineligibility
node radio modem, and	wireless communication. Instead, the processes simply communicate data in a well-known manner. Thus, the claim language is ubiquitous to radio communications and is nothing more than abstraction of a generic radio communication. The claimed networking elements do not provide "significantly more" as *Alice* requires. These elements are merely any nodes and any wireless transmissions of any data. They do not recite improvements to radio communications structures. Further these elements are known in the art, and are admitted prior art and are thus exactly the well-understood, routine, conventional activity described in *Mayo* (as evidenced in the prior art claim charts included in these responses).
dynamically updating a second node link tree comprising second node link entries representing each of the plurality of second nodes so that the data packet transmission path to the first node is optimized.	The "updating" clause is abstract. It adds a process that "dynamically updating a second node link tree comprising second node link entries representing each of the plurality of second nodes so that the data packet transmission path to the first node is optimized." For example, it is not expressed how the link tree is "updated" or the path "optimized," for example, rendering the language abstract, particularly due to the abstract nature of "optimized." Moreover, in a network environment, processes that "update" link trees are common. Thus, the clause is abstract in general because its characteristics are not described, and is abstract in particular because it is in no way implemented in the claim. The "updating" recitation does not add "significantly more" to the abstract radio network of the claim because it is not otherwise mentioned, used, or implemented in the claim, e.g., in the transmission of data. Further, "updating" link trees is a well-understood, routine, and conventional activity, as shown and described throughout

The '496 Patent – Claims	Reasons for Patent Ineligibility
	the prior art claim charts included in these responses.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

Invalidity Chart for U.S. Patent No. 6,249,516

The '516 Patent – Claims	
1. A server providing a gateway between two networks, where at least one of the two networks is a wireless network, said server comprising: a radio modem capable of communicating with a first network that operates, at least in part, by wireless communication; a network interface capable of communicating with a second network; and a digital controller coupled to said radio modem and to said network interface, said digital controller communicating with said first network via said radio modem and communicating with said second network via said network interface, said digital controller passing data packets received from said first network that are destined for said second network to said second network, and passing data packets received from said second network that are destined for said first network to said first network,	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. Regarding this element, the specification of the '516 patent does not clearly link the claimed functions associated with the "passing" limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform "passing" as claimed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '516 Patent – Claims	
said digital controller maintaining a map of data packet transmission paths of a plurality of clients of said first network, where a transmission path of a client of said first network to said server can be through one or more of other clients of said first network;	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '516 patent does not clearly link the claimed functions associated with the "maintaining a map of data transmission paths" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a map of data packet transmission paths as claimed.
wherein said digital controller changes the transmission paths of clients to optimize the transmission paths including changing the transmission path from the client to the gateway so that the path to the gateway is chosen from the group consisting essentially of the path to the gateway through the least possible number of additional clients, the path to the gateway through the most robust additional clients, the path to the gateway through the clients with the least amount of traffic, and the path to the gateway through the fastest clients.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose that the server "changes the transmission paths of clients to optimize the transmission paths including changing the transmission path from the client to the gateway so that the path to the gateway is chosen from the group…". Instead, the specification discloses that the clients select paths to the server and the clients optimize those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the

The '516 Patent – Claims	
	server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be

The '516 Patent – Claims	
	updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '516 Patent – Claims	
	informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a server changes client paths, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path.

The '516 Patent – Claims	
	Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers gateway optimization of paths, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '516 patent does not clearly link the claimed functions associated with the "changes the transmission paths" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform changes to "the transmission paths" as claimed. The optimization and "most robust" recitations also render the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as

The '516 Patent – Claims	
	"optimal" or "most robust," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the optimization can involve multiple factors, despite the language "chosen from the group consisting essentially of," the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at the server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.
2. A server as recited in claim 1, wherein the second network is a TCP/IP protocol network.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim.
4. A server as recited in claim 1, wherein the digital controller translates data packets received from the second network and destined for the first network into a format used by the first network, and the digital controller translates data packets received from the first network and	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. Moreover, the specification of the '516 patent does not clearly link the claimed functions associated with the translating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform translation as claimed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '516 Patent – Claims	
destined for the second network into a format used by the second network.	
5. A server as recited in claim 2: wherein the digital controller receives data packets from the TCP/IP protocol network destined for a client of the first network, adds a header that includes an address of the client of the first network and a data transmission path to the client of the first network, adds a indicator of the type of data associated with the packet, and transmits the packet via the radio modem with the header and the indicator; and wherein the digital controller receives data packets from the first network destined for the TCP/IP protocol network, converts the data packets into TCP/IP format, and sends the TCP/IP format data packet to an IP address on the TCP/IP protocol network.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. Moreover, the specification of the '516 patent does not clearly link the claimed functions associated with the translating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform translation as claimed.
10. A method providing a gateway between a wireless network and a	This claim is invalid under 35 U.S.C. § 112.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '516 Patent – Claims	
second network comprising: receiving a data packet from a client of said wireless network, converting said data packet to a proper format for said second network, and sending said data packet to said second network; and receiving a data packet from said second network, adding a header to said packet including a reverse link and a data packet type if said data packet is destined for a client of said wireless network, said reverse link being one of a direct link to said client and an indirect link to said client through one or more other clients of said network, and transmitting said data packet with said header; and	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. Regarding this element, the specification of the '516 patent does not clearly link the claimed functions associated with the receiving limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform receiving as claimed. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
changing transmission paths of clients to optimize the transmission paths including changing the transmission path from the client to the gateway so that the path to the gateway is chosen from the group consisting essentially of the path to the gateway through the least possible number of additional clients, the path to the gateway through the most robust additional	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a gateway that changes "transmission paths of clients to optimize the transmission paths including changing the transmission path from the client to the gateway so that the path to the gateway is chosen from the group …". Instead, the specification discloses that the clients select paths to the server and the clients optimize those paths. The following portions of the specification support that the

The '516 Patent – Claims	
clients, the path to the gateway through the clients with the least amount of traffic, and the path to the gateway through the fastest clients.	clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be

The '516 Patent – Claims	
	appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when

The '516 Patent – Claims	
	clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a gateway performs optimization of paths selected by clients. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o.

The '516 Patent – Claims	
	The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server optimization of paths, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained.

The '516 Patent – Claims	
	Moreover, the specification of the '516 patent does not clearly link the claimed functions associated with the "changing the transmission path" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform "changing the transmission path" as claimed. The optimization and "most robust" recitations also render the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal" or "most robust," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, despite the language "chosen from the group consisting essentially of," the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at the server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.
11. A method as recited in claim 10: wherein the second network is a TCP/IP protocol network;	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '516 Patent – Claims	
wherein the data packet received from a client of a wireless network is converted to a TCP/IP format if it is destined for an IP address on a TCP/IP protocol network, and the TCP/IP format data packet is sent to the IP address on the TCP/IP protocol network; and wherein the data packet received from the second network is received from the TCP/IP protocol network.	Moreover, the specification of the '516 patent does not clearly link the claimed functions associated with the translating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform translation as claimed.
13. A method as recited in claim 10 further comprising maintaining a map of data packet transmission paths of a plurality of clients of the wireless network, where a transmission path of a client of the wireless network to the server can be through one or more other clients of the first network.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. Further, the specification of the '516 patent does not clearly link the claimed functions associated with the "maintaining a map of data transmission paths" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a map of data packet transmission paths as claimed.
14. A method as recited in claim 13, further comprising dynamically updating the map of data packet transmission paths to optimize the data packet transmission paths of the	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. Further, the claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient

The '516 Patent – Claims	
clients.	written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a gateway that "dynamically update[es] the map of data packet transmission paths to optimize the data packet transmission paths of the clients." Instead, the specification discloses that the clients select paths to the server and the clients optimize those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '516 Patent – Claims	
	data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that

The '516 Patent – Claims	
	server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a server performs

The '516 Patent – Claims	
	optimization of paths of the clients. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '516 Patent – Claims	
	As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server optimization of paths, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '516 patent does not clearly link the claimed functions associated with the "dynamically updating the map of data packet transmission paths to optimize the data packet transmission paths of the clients" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform "dynamically updating the map of data packet transmission paths to optimize the data packet transmission paths of the clients" as claimed. The optimization recitations also render the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at the server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present

The '516 Patent – Claims	
	preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

Invalidity Chart for U.S. Patent No. 8,000,314

The '314 Patent – Claims	
1. A wireless network system comprising: a first node including a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling said first node radio modem, said first node process including receiving and transmitting data packets via said first node radio modem; a plurality of second nodes each including a second node controller and a second node radio modem, said second node controller implementing a second node process that includes controlling of said second node radio modem, said second node process including receiving and transmitting data packets via said second node radio modem,	The claim is invalid under 35 U.S.C. § 112.
wherein said second node process of each of said second nodes includes selecting a radio transmission path to said first node that is direct or	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '314 Patent – Claims	
through at least one of the remainder of said plurality of second nodes; and	The specification of the '314 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the second node's actions in selecting cannot be reasonably ascertained.
wherein said selected path to said first node utilizes the least number of other second nodes, such that said transmission path from each of said second nodes to said first node is optimized and the first node controller implements changes to upgrade the selected transmission path in response to a request from at least one of said second nodes.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a first node, as claimed, that "implements changes to upgrade the selected transmission path in response to a request from at least one of said second nodes." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "upgrade" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client

The '314 Patent – Claims	
	18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16

The '314 Patent – Claims	
	through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7.

The '314 Patent – Claims	
	"In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a server upgrades paths selected by clients. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the

The '314 Patent – Claims	
	description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server upgrades of paths, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '314 patent does not clearly link the claimed functions associated with the upgrade limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform upgrading as claimed. The optimization recitations also render the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed upgrading can involve multiple factors, the specification fails to disclose or enable an upgrading algorithm of

The '314 Patent – Claims	
	that employs multiple factors in such a process, particularly at the server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-upgrading process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.
4. A first node providing a gateway between a wireless network and a second network, the first node comprising: a first data packet receiver configured to receive a data packet from a second node of said wireless network, a first converter configured to convert the data packet to a format used in said second network, and a data packet sender configured to send the data packet to a proper location on said second network; and a second data packet receiver configured to receive the data packet from said second network, a second converter configured to convert the data packet to a format used in said	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. Regarding this element, the specification of the '314 patent does not clearly link the claimed functions associated with the converting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform converting as claimed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '314 Patent – Claims	
wireless network, and a data packet sender configured to send said data packet with a header to a second node of said wireless network; and	
a controller configured to implement changes to a transmission path from the second node to the first node based upon viable network paths observed by the second node so that the path to the first node is chosen from the group consisting essentially of the path to first node through the least possible number of additional second nodes, the path to the first node through the most robust additional second nodes, the path to the first node through the second nodes with the least amount of traffic, and the path to the first node through the fastest second nodes.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a gateway that implements "changes to a transmission path from the second node to the first node based upon viable network paths observed by the second node so that the path to the first node is chosen from the group…". Instead, the specification discloses that the client selects paths to the server and the client changes those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client

The '314 Patent – Claims	
	18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '314 Patent – Claims	
	through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7.

The '314 Patent – Claims	
	"In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a server changes paths selected by clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the

The '314 Patent – Claims	
	description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server changing paths for optimization, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '314 patent does not clearly link the claimed functions associated with the "changing the transmission paths" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform "changing the transmission paths" as claimed. The "most robust" recitation also renders the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "most robust," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed changing can involve multiple factors, despite the language "chosen from the group consisting essentially

The '314 Patent – Claims	
	of," the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at the server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.
10. A client node in a network including a server node having a server radio modem and a server controller which implements a server process that includes controlling the server node to receive and transmit data packets via said server node to other nodes in the network, the client node comprising: a client node radio modem; and a client node controller; said client node controller implementing a process including receiving and transmitting data packets via said client modem;	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this preamble renders the claim indefinite. It is unclear whether an accused infringer or prior art reference needs to include the recited features of the server found in the preamble, as the body of the claim does not make clear which features of the server are related to the features recited in the body of the claim. The claim is invalid under 35 U.S.C. § 112(b) as this preamble renders the claim indefinite. It is unclear whether an accused infringer or prior art reference needs to include the recited features of the server found in the preamble, as the body of the claim does not make clear which features of the server are related to the features recited in the body of the claim.
selecting a radio transmission path to said server node that is one of a direct	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written

The '314 Patent – Claims	
link to said server node and an indirect link to said server node through at least one other client node;	description to enable the full scope of the claimed invention. The specification of the '314 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the client node's actions in selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
implementing a process requesting updated radio transmission path data from said server node, and in response thereto, implementing by the server node changes to upgrade the selected transmission path to an optimized transmission path.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose "implementing by the server node changes to upgrade the selected transmission path to an optimized transmission path." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "upgrade" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to

The '314 Patent – Claims	
	control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '314 Patent – Claims	
	path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7

The '314 Patent – Claims	
	currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a server upgrades paths selected by clients. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the

The '314 Patent – Claims	
	digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server upgrades of paths of the clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '314 patent does not clearly link the claimed functions associated with the changes to upgrade limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform changes to upgrade as claimed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '314 Patent – Claims	
	The optimization recitations also render the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at the server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.
12. A first node providing a gateway between two networks, where at least one of the two networks is a wireless network, said first node comprising: a radio modem capable of communicating with a first network that operates in part, by wireless communication; a network interface to communicating with a second network;	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. Regarding this element, the specification of the '314 patent does not clearly link the claimed functions associated with the "passing" limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform "passing" as claimed.

The '314 Patent – Claims	
a digital controller coupled to said radio modem and to said network interface, said digital controller communicating with said first network via said radio modem and communicating with said second network via said network interface, said digital controller passing data packets received from said first network that are destined for said second network to said second network, and passing data packets received from said second network that are destined for said first network to said first network,	
said digital controller maintaining a map of data packet transmission paths to a plurality of second nodes of said first network, where a transmission path of a second node of said first network to said first node can be through one or more of other second node of said first network;	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '314 patent does not clearly link the claimed functions associated with the "maintaining a map of data packet transmission paths" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a map of data packet transmission paths as claimed.
wherein said digital controller changes the transmission paths of each of the second nodes to optimize the transmission paths including	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '314 Patent – Claims	
changing each transmission path from on of the plurality of said second nodes to the first node so that the path to the first node is chosen from the group consisting essentially of the path to the first node through the least possible number of additional second nodes, the path to the first node through the most robust additional second nodes, the path to the first node through the second nodes with the least amount of traffic, and the path to the first node through the fastest second nodes.	The limitation "from on of the plurality" is indefinite. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose "chang[ing] the transmission paths of each of the second nodes to optimize the transmission paths including changing each transmission path from on of the plurality of said second nodes to the first node so that the path to the first node is chosen from the group….," to the extent "from on of the plurality" has any meaning. Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '314 Patent – Claims	
	hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67.

The '314 Patent – Claims	
	"As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21.

The '314 Patent – Claims	
	In contrast, nothing in the Brownrigg patents discloses that a gateway optimizes paths selected by clients. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from

The '314 Patent – Claims	
	the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers gateway optimization of paths, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the gateway's actions cannot be reasonably ascertained. Moreover, the specification of the '314 patent does not clearly link the claimed functions associated with the changes to optimize limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform changes to optimize as claimed. The optimization and "most robust" recitations also render the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal" or "most robust," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, despite the language "chosen from the group consisting essentially of," the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a gateway. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '314 Patent – Claims	
	preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.
13. A first node as recited in claim 12, wherein the digital controller translates data packets received from the second network and destined for the first network into a format used by the first network, and the digital controller converts data packets received from the first network and destined for the second network into a format used by the second network.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. Moreover, the specification of the '314 patent does not clearly link the claimed functions associated with the translating and converting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform translation and converting as claimed.
14. A first node providing a gateway between a wireless network and a second network, the first node comprising: a first data packet receiver implementing a process to receive a data packet from a second node of said wireless network, a first converter implementing a process to convert said data packet to a format	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '314 patent does not clearly link the claimed functions associated with the converting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform converting as claimed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '314 Patent – Claims	
used in said second network, and a first transmitter implementing a process to transmit said data packet to a proper location on said second network; and a second data packet receiver implementing a process to receive a data packet from said second network, a second converter implementing a process to convert said data packet to a format used in said wireless network, and a second transmitter implementing a process to transmit said data packet with a header to a second node of said wireless network; and	
a controller implementing a process to change a transmission path to optimize a transmission path includes changing the transmission path from the second node to the first node so that the path to the first node is chosen from the group consisting essentially of the path to the first node through the least possible number of additional second nodes, the path to the first node through the most robust additional second nodes, the path to	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a first node, as claimed, that "implement[s]a process to change a transmission path to optimize a transmission path includ[ing] changing the transmission path from the second node to the first node so that the path to the first node is chosen from the group…" Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other

The '314 Patent – Claims	
the first node through the second nodes with the least amount of traffic, and the path to the first node through the fastest second nodes.	Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or

The '314 Patent – Claims	
	optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a

The '314 Patent – Claims	
	server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a server optimizes paths selected by clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o.

The '314 Patent – Claims	
	The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers a gateway that optimizes paths of second nodes, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the gateway's actions cannot be reasonably ascertained.

The '314 Patent – Claims	
	Moreover, the specification of the '314 patent does not clearly link the claimed functions associated with the optimizing limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform optimizing as claimed. The optimization and "most robust" recitations also render the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal" or "most robust," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, despite the language "chosen from the group consisting essentially of," the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a gateway. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-upgrading process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.

Invalidity Chart for U.S. Patent No. 8,233,471

The '471 Patent – Claims	
2. A wireless network system comprising: a server including a server controller and a server radio modem, said server controller implementing a server process that includes the control of said server radio modem, said server process including the receipt and transmission of data packets via said server radio modem; and a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes the control of said client radio modem, said client process including the receipt and transmission of data packets via said client radio modem,	This claim is invalid under 35 U.S.C. § 112.
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the initiating and selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
	perform initiating and selecting as claimed. Additionally, this element is indefinite, as the scope of the clients's actions in initiating and selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
wherein said server process further includes logic that maintains a client link tree having client link entries corresponding to an optimized transmission path for each of the plurality of clients, and	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the maintaining "a client link tree having client link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a client link tree having client link entries. Also, the terms "client link tree" and "client link entries corresponding to" are indefinite because it is unclear what represents a tree, an entry, and the scope of the claimed correspondence.
wherein the server process is configured to: receive the selected transmission path from each of the plurality of clients, determine the optimized transmission	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to

The '471 Patent – Claims	
path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the optimized transmission path, and send the optimized transmission path for each of the clients to the respective clients.	sufficiently disclose a server process, as claimed, configured to "determine the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the optimized transmission path, and send the optimized transmission path for each of the clients to the respective clients." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of

The '471 Patent – Claims	
	data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that

The '471 Patent – Claims	
	server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a server optimizes paths

The '471 Patent – Claims	
	selected by clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification.

The '471 Patent – Claims	
	As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers a server that optimizes paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the optimization limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform optimization as claimed. The optimization recitations also render the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
	patent at 9:11-16. Moreover, the limitation "send the optimized transmission path for each of the clients to the respective clients" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "optimized transmission path" is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "send the optimized transmission path for each of the clients to the respective clients" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "the optimized transmission path" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform sending as claimed.
3. A wireless network system as recited in claim 2, wherein said server process further comprises: logic that compares a selected link from said client to said server to a current client link entry in said client link tree; and logic that updates said client link tree when said comparison meets	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
predetermined conditions.	be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.
4. A wireless network system as recited in claim 3, wherein said server process further comprises: logic that determines if said client is authentic; logic that determines if said client is already in said client link tree if client is determined to be authentic; logic that deletes said client from said client link tree if said client is already in said client link tree; and logic that inserts said client in said client link tree if said client is authentic.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.
6. A wireless network system comprising: a server providing a server process including: receiving data packets via a server wireless communication, sending data packets via said wireless communication, communicating with a network, and performing housekeeping functions; and	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite. The limitation "housekeeping functions" is indefinite as it cannot be reasonably ascertained what constitutes a housekeeping function, and the specification fails to adequately disclose the scope of such functions.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
a plurality of clients, each client providing a client process including sending and receiving data packet via a client wireless communication, maintaining a send/receive data buffer in digital memory, and	
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the clients's actions in selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
wherein said server process further comprises maintaining a client link tree having client link entries corresponding to an optimized transmission path for each of the	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the "maintaining a client link tree having client link entries" limitation to a disclosed

The '471 Patent – Claims	
plurality of clients, and	algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a client link tree having client link entries. Also, the terms "client link tree" and "client link entries corresponding to" are indefinite because it is unclear what represents a tree, an entry, and the scope of the claimed correspondence.
wherein the server process is configured to: receive the selected transmission path from each of the plurality of clients, determine the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the optimized transmission path, and send the optimized transmission path for each of the clients to the respective clients.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a server process, as claimed, configured to "determine the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the optimized transmission path, and send the optimized transmission path for each of the clients to the respective clients." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the

The '471 Patent – Claims	
	server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be

The '471 Patent – Claims	
	updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7

The '471 Patent – Claims	
	informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a server optimizes paths selected by clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path.

The '471 Patent – Claims	
	Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers a server that optimizes paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the optimization limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform optimization as claimed. The optimization recitations also render the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal," as such is a

The '471 Patent – Claims	
	subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Moreover, the limitation "send the optimized transmission path for each of the clients to the respective clients" is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "send the optimized transmission path for each of the clients to the respective clients" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "the optimized transmission path" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform sending as claimed.

The '471 Patent – Claims	
7. A wireless network system as recited in claim 6, wherein said server process is further configured to: compare a selected link from said client to said server to a current client link entry in said client link tree; and update said client link tree when said comparison meets predetermined conditions.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.
8. A wireless network system as recited in claim 7, wherein said server process is further configured to: determine if said client is authentic; determine if said client is already in said client link tree if client is determined to be authentic; delete said client from said client link tree if said client is already in said client link tree; and insert said client in said client link tree if said client is authentic.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.

The '471 Patent – Claims	
10. A method for providing wireless network communication comprising: providing a server implementing a server process including receiving data packets via RF transmission, sending data packets via RF transmission, communicating with a network, and performing housekeeping functions; and providing a plurality of clients, each client providing a client process including sending and receiving data packet via RF transmission, maintaining a send/receive data buffer in digital memory, and	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite. The limitation "housekeeping functions" is indefinite as it cannot be reasonably ascertained what constitutes a housekeeping function, and the specification fails to adequately disclose the scope of such functions.
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the clients's actions in selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is

The '471 Patent – Claims	
	not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
wherein the server process: receives the selected transmission path from each of the plurality of clients determines the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients updates the client link entries to provide the optimized transmission path, and sends the optimized transmission path for each of the clients to the respective clients.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a server process, as claimed, that "determines the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the optimized transmission path, and sends the optimized transmission path for each of the clients to the respective clients." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client

The '471 Patent – Claims	
	18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16

The '471 Patent – Claims	
	through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7.

The '471 Patent – Claims	
	"In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a server optimizes paths selected by clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the

The '471 Patent – Claims	
	description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers a method of server optimization of paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the optimization limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform optimization as claimed. The optimization recitations also render the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, the specification fails to disclose or enable an optimization

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
	algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Moreover, the limitation "sends the optimized transmission path for each of the clients to the respective clients" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "optimized transmission path" is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "sends the optimized transmission path for each of the clients to the respective clients" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "the optimized transmission path" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform sending as claimed.
11. A method as recited in claim 10,	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. §

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
wherein said server process further includes: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.
12. A method as recited in claim 11, wherein said server process further includes: determining is said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is already in said client link tree; and inserting said client in said client link tree if said client is authentic.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.
14. A method for providing wireless network communication comprising the steps of:	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite. The

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
a server process including a data packet reception step, a data packet transmission step, a network communication step, and a housekeeping step; and a plurality of clients each providing a client process including a data sending and receiving step, a send and receive data buffer maintenance step, and	limitation "housekeeping step" is indefinite as it cannot be reasonably ascertained what constitutes a housekeeping step, and the specification fails to adequately disclose the scope of such functions.
a link selection step that is one of a direct link to a server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the link selection limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform link selection as claimed. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
wherein said server process further comprises the step of maintaining a client link tree having client link entries corresponding to an optimized	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
transmission path for each of the plurality of clients, and	maintaining "a client link tree having client link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a client link tree having client link entries. Also, the terms "client link tree" and "client link entries corresponding to" are indefinite because it is unclear what represents a tree, an entry, and the scope of the claimed correspondence.
wherein the server process: receives the selected transmission path from each of the plurality of clients, determines the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the optimized transmission path, and sends the optimized transmission path for each of the clients to the respective clients.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a server process, as claimed, that "determines the optimized transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the optimized transmission path, and sends the optimized transmission path for each of the clients to the respective client." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network.

The '471 Patent – Claims	
	The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
	through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client

The '471 Patent – Claims	
	7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses a method of server optimization of paths selected by clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an

The '471 Patent – Claims	
	optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers a method of server optimization of paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the optimization limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform optimization as claimed. The optimization recitations also render the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the

The '471 Patent – Claims	
	invention. In particular, it is unclear what would be regarded as "optimal," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Moreover, the limitation "sends the optimized transmission path for each of the clients to the respective client" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "optimized transmission path" is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "sends the optimized transmission path for each of the clients to the respective client" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "the optimized transmission path" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm

The '471 Patent – Claims	
	that performs each of the claimed functions, and the disclosed algorithms do not clearly perform sending as claimed.
15. A method as recited in claim 14, wherein said server process further comprises the steps of: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.
16. A method as recited in claim 15, wherein said server process further comprises steps of: determining if said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is already in said client link tree; and	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
inserting said client into said client link tree if said client is authentic.	
17. A wireless network system comprising: a first node including a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling of said first node radio modem, said first node process including receiving and transmitting data packets via said first node radio modem; a plurality of second nodes each including a second node controller implementing a second node process that includes controlling a second node radio modem, said second node process including receiving and transmitting data packets via said second node radio modem,	This claim is invalid under 35 U.S.C. § 112.
wherein said second node process of each of said second nodes includes initiating a radio transmission path to said first node that is a link to said first node through at least one of the remainder of said plurality of second	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the initiating limitations to a disclosed algorithm that performs each

The '471 Patent – Claims	
nodes; and	of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the second node's actions in selecting cannot be reasonably ascertained.
wherein said first node process dynamically updates a second node link tree comprising second node link entries and dynamically modifies the second node link tree so that the data packet transmission from the first node is optimized.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a first node process "dynamically modifies the second node link tree so that the data packet transmission from the first node is optimized." Instead, the specification discloses that the clients select paths to the server and the clients optimize those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64.

The '471 Patent – Claims	
	"It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
	18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
	server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses a first node process, as claimed, that dynamically modifies the second node link tree so that the data packet transmission from the first node is optimized. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8)

The '471 Patent – Claims	
	where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers a first node that optimizes paths, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the first node's actions cannot be reasonably ascertained. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the dynamically modifying limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform dynamically modifying as claimed. The optimization recitation also renders the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
	a first node as claimed. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.
18. A wireless network system as recited in claim 17, wherein at least one of the second nodes is a mobile device and said first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and logic dynamically updating said second node link tree when said comparison meets predetermined conditions.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.
19. A wireless network system as recited in claim 18 wherein said first	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim.

The '471 Patent – Claims	
node process further comprises: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; and logic inserting one of the plurality of said second nodes in said second node link tree if one of the plurality of said second nodes is authentic and is not already in said second node link tree.	The specification of the '471 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.
20. A wireless system comprising: a first node implementing a first node process including receiving data packets via a first node wireless radio, sending data packets via said wireless radio, communicating with a network, and performing node link tree housekeeping functions; a plurality of second nodes, each second node implementing a second node process including sending and receiving data packet via a second	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite. The limitation "housekeeping functions" is indefinite as it cannot be reasonably ascertained what constitutes a node link tree housekeeping function, and the specification fails to adequately disclose the scope of such functions.

The '471 Patent – Claims	
node wireless radio, maintaining a send/receive data buffer in a digital memory, and	
selecting a link to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the second node's actions in selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
the first node process further comprises maintaining a second node link tree having second node link entries,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the "maintaining a second node link tree having second node link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a second node link tree having second node link entries.

The '471 Patent – Claims	
	Also, the term "second node link entries" is indefinite because it is unclear what represents an entry.
dynamically updating the tree to reflect the current operational status of the nodes, and rerouting data packets around inactive or malfunctioning nodes.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a first node process "dynamically updating the tree to reflect the current operational status of the nodes, and rerouting data packets around inactive or malfunctioning nodes." Instead, the specification discloses that the client selects paths to the server and the clients optimize those paths by rerouting around inactive or malfunctioning nodes. The following portions of the specification support that the clients reroute data packets (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64.

The '471 Patent – Claims	
	"It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and

The '471 Patent – Claims	
	18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a

The '471 Patent – Claims	
	server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a server performs rerouting of data packets in the manner claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct

The '471 Patent – Claims	
	path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers a server that reroutes data packets, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the dynamically updating and rerouting limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform dynamically updating and rerouting as claimed. Moreover, to the extent that SIPCO contends that the claimed rerouting can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a first node as claimed. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to

The '471 Patent – Claims	
	stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.
21. A wireless system as recited in claim 20, wherein the first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and logic dynamically updating said second node link tree when said comparison meets predetermined conditions.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.
22. A wireless system as recited in claim 21, wherein the first node process further includes: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
nodes is determined to be authentic; logic deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is already in said second node link tree; and logic inserting one of the plurality of said second nodes in said second node link tree if said second node is authentic.	
31. A wireless system comprising: a first node implementing a first node process including receiving data packets via a first node wireless radio, sending data packets via said wireless radio, and communicating with a network; a plurality of second nodes, each second node implementing a second node process including sending and receiving data packet via a second node wireless radio, maintaining a send/receive data buffer in a digital memory, and	This claim is invalid under 35 U.S.C. § 112.
selecting a link to said first node that is one of a direct link to said first node and an indirect link to said first node	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
through at least one of the remainder of said plurality of second nodes; and	The specification of the '471 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the second node's actions in selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
the first node process further comprises maintaining a second node link tree having second node link entries.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the "maintaining a second node link tree having second node link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a second node link tree having second node link entries. Also, the term "second node link entries" is indefinite because it is unclear what represents an entry.
32. A wireless system as recited in claim 31, wherein the first node process further comprises:	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim.

The '471 Patent – Claims	
logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and logic updating said second node link tree when said comparison meets predetermined conditions.	The specification of the '471 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.
33. A wireless system as recited in claim 32, wherein the first node process further includes: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; logic deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is already in said second node link tree; and logic inserting one of the plurality of said second nodes in said second node	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
link tree if said second node is authentic.	
34. A method for providing wireless network communication comprising: providing a first node implementing a first node process including receiving data packets via R.F. transmission and sending data packets via R.F. transmission; providing a plurality of second nodes, each second node providing a second node process including sending and receiving data packet via R.F. transmission, maintaining a send/receive data buffer in digital memory, and	This claim is invalid under 35 U.S.C. § 112.
selecting a transmission path to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the second nodes's actions in selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite.

The '471 Patent – Claims	
	Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
maintaining a second node link tree having second node link entries at the first node.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the "maintaining a second node link tree having second node link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a second node link tree having second node link entries. Also, the term "second node link entries" is indefinite because it is unclear what represents an entry.
35. A method as recited in claim 34, wherein said first node process further includes: comparing a selected link from one of the plurality of said second nodes to said first node to a second node link entry in said second node link tree; and updating said second node link tree when said comparison meets at least one of several predetermined	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets at least one of several predetermined conditions meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition, how it is predetermined, what the "several" conditions

The '471 Patent – Claims	
conditions.	are, and whether they need to be simultaneously met, and the specification fails to adequately disclose how such function is performed.
36. A method as recited in claim 34, wherein said first node process further includes: determining if one of the plurality of said second nodes is authentic; deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is already in said second node link tree; and inserting one of the plurality of said second nodes in said second node tree if said second node is authentic.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '471 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.
40. In a network including a plurality of client nodes having a client radio modem and a client controller which implements a client process including receiving and transmitting data packets via said client node to other nodes in the network, a server node comprising: a server node radio modem; and a server node controller	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this preamble renders the claim indefinite. It is unclear whether an accused infringer or prior art reference needs to include the recited features of the client found in the preamble, as the body of the claim does not make clear which features of the client are related to the features recited in the body of the claim.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '471 Patent – Claims	
implementing a server process, said server process configured to:	
receive selected transmission paths from each of the plurality of client nodes, wherein said transmission path is one of a direct link to the server node and an indirect link to said server node through at least one other client node;	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '471 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the client node's actions in selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
determine an optimized transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes; and send the optimized transmission path for each of the plurality of client nodes to the respective client node.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a server process, as claimed, configured to "determine an optimized transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes, and send the optimized transmission path for each of the plurality of client nodes to the respective client node." Instead, the specification discloses that the clients select paths to the

The '471 Patent – Claims	
	server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the

The '471 Patent – Claims	
	number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17.

The '471 Patent – Claims	
	"As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses server optimization of paths selected by clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server

The '471 Patent – Claims	
	process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server optimization of paths of clients, the specification fails to enable the full scope of the claimed invention.

The '471 Patent – Claims	
	Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the optimization limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform optimization as claimed. The optimization recitations also render the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Moreover, the limitation "send the optimized transmission path for each of the plurality of client nodes to the respective client node" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "optimized transmission path"

The '471 Patent – Claims	
	is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "send the optimized transmission path for each of the plurality of client nodes to the respective client node" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "the optimized transmission path" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform sending as claimed.
41. The server node of claim 40, wherein the server process is further configured to perform gateway functions.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. Moreover, the specification of the '471 patent does not clearly link the claimed functions associated with the gateway functions limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform gateway functions as claimed. Moreover, the limitation "perform gateway functions" is indefinite as it cannot be reasonably ascertained what constitutes a gateway function, and the specification fails to adequately disclose how such function is performed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

Invalidity Chart for U.S. Patent No. 8,625,496

The '496 Patent – Claims	
1. A wireless network system comprising: a server including a server controller and a server radio modem, said server controller implementing a server process that includes the control of said server radio modem, said server process including the receipt and transmission of data packets via said server radio modem; a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes the control of said client radio modem, said client process including the receipt and transmission of data packets via said client radio modem,	This claim is invalid under 35 U.S.C. § 112.
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the initiating and selecting limitations to a disclosed algorithm that

The '496 Patent – Claims	
remainder of said plurality of clients; and	performs each of the claimed functions, and the disclosed algorithms do not clearly perform initiating and selecting as claimed. Additionally, this element is indefinite, as the scope of the clients's actions in initiating and selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
wherein the server process is configured to: receive information identifying the selected transmission path from each of the plurality of clients; determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients; send information identifying the server selected transmission path for each of the clients to the respective clients; and	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a server process, as claimed, configured to "determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, [and] send information identifying the server selected transmission path for each of the clients to the respective clients." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to

The '496 Patent – Claims	
	control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication

The '496 Patent – Claims	
	path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7

The '496 Patent – Claims	
	currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses a server that determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example

The '496 Patent – Claims	
	refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server optimization of paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the server selected path limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform determining server selected paths as claimed.

The '496 Patent – Claims	
	Moreover, to the extent that SIPCO contends that the claimed selection can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Moreover, the limitation "send information identifying the server selected transmission path for each of the clients to the respective clients" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "information identifying the server selected transmission path" is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "send information identifying the server selected transmission path for each of the clients to the respective clients" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "information identifying the server selected transmission path for each of the clients" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not

The '496 Patent – Claims	
	clearly perform sending as claimed.
maintain a client link tree having client link entries representing each of the plurality of clients.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a client link tree having client link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a client link tree having client link entries. Also, the terms "client link tree" and "client link entries representing" are indefinite because it is unclear what represents a tree, an entry, and the scope of the claimed representativeness.
2. A wireless network system comprising: a server including a server controller and a server radio modem, said server controller implementing a server process that includes the control of said server radio modem, said server process including the receipt and transmission of data packets via said server radio modem; and a plurality of clients each including a client controller and a client radio modem, said client controller	This claim is invalid under 35 U.S.C. § 112.

The '496 Patent – Claims	
implementing a client process that includes the control of said client radio modem, said client process including the receipt and transmission of data packets via said client radio modem,	
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the initiating and selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform initiating and selecting as claimed. Additionally, this element is indefinite, as the scope of the clients's actions in initiating and selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
wherein said server process further includes logic that maintains a client link tree having client link entries representing each of the plurality of clients,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a client link tree having client link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms

The '496 Patent – Claims	
	do not clearly "maintain" a client link tree having client link entries. Also, the terms "client link tree" and "client link entries representing" are indefinite because it is unclear what represents a tree, an entry, and the scope of the claimed representativeness.
and wherein the server process is configured to: receive information identifying the selected transmission path from each of the plurality of clients, determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, and send information identifying the server selected transmission path for each of the clients to the respective clients.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a server process, as claimed, configured to "determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, and send information identifying the server selected transmission path for each of the clients to the respective clients." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6.

The '496 Patent – Claims	
	"If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at

The '496 Patent – Claims	
	9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream'

The '496 Patent – Claims	
	from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses a server that determines a server selected path based on the selected transmission paths received from the plurality of clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path.

The '496 Patent – Claims	
	Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server optimization of paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the server selected path limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform determining server selected paths as claimed. Moreover, to the extent that SIPCO contends that the claimed selection can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server.

The '496 Patent – Claims	
	In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Moreover, the limitation "send information identifying the server selected transmission path for each of the clients to the respective clients" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "information identifying the server selected transmission path" is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "send information identifying the server selected transmission path for each of the clients to the respective clients" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "information identifying the server selected transmission path for each of the clients" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform sending as claimed.
3. A wireless network system as	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. §

The '496 Patent – Claims	
recited in claim 2, wherein said server process is further configured to: compare a selected link from said client to said server to a current client link entry in said client link tree; and update said client link tree when said comparison meets predetermined conditions.	112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.
4. A wireless network system as recited in claim 2, wherein said server process is further configured to: determine if said client is authentic; determine if said client is already in said client link tree if said client is determined to be authentic; delete said client from said client link tree if said client is authentic and is already in said client link tree; and insert said client in said client link tree if said client is authentic and is not already in said client link tree.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.
5. The wireless network system of claim 2, wherein the client link entries	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim.

The '496 Patent – Claims	
correspond to the server selected transmission path between the server and the respective client.	Also, the term "client link entries correspond to" is indefinite because it is unclear what represents an entry and the scope of the claimed correspondence.
7. A wireless network system comprising: a server providing a server process including receiving data packets via a server wireless communication, sending data packets via said wireless communication, communicating with a network, and performing housekeeping functions; and a plurality of clients, each client providing a client process including sending and receiving data packet via a client wireless communication, maintaining a send/receive data buffer in digital memory, and	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite. The limitation "housekeeping functions" is indefinite as it cannot be reasonably ascertained what constitutes a housekeeping function, and the specification fails to adequately disclose the scope of such functions.
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
remainder of said plurality of clients,	The specification of the '496 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the clients's actions in selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
wherein said server process further comprises maintaining a client link tree having client link entries representing each of the plurality of clients, and wherein the server process is configured to:	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a client link tree having client link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a client link tree having client link entries. Also, the terms "client link tree" and "client link entries representing" are indefinite because it is unclear what represents a tree, an entry, and the scope of the claimed representativeness.
receive information identifying the selected transmission path from each of the plurality of clients, determine a server selected transmission path for each of the	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to

The '496 Patent – Claims	
plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the server selected transmission path, and send information identifying the server selected transmission path for each of the clients to the respective clients.	sufficiently disclose a server process, as claimed, configured to "determine a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, update the client link entries to provide the server selected transmission path, and send information identifying the server selected transmission path for each of the clients to the respective clients." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of

The '496 Patent – Claims	
	data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that

The '496 Patent – Claims	
	server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses a server that determines a

The '496 Patent – Claims	
	server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the

The '496 Patent – Claims	
	clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server optimization of paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the server selected path limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform determining server selected paths as claimed. Moreover, to the extent that SIPCO contends that the claimed selection can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Moreover, the limitation "send information identifying the server selected transmission path for each of the clients to the respective clients" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "information

The '496 Patent – Claims	
	identifying the server selected transmission path" is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "send information identifying the server selected transmission path for each of the clients to the respective clients" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "information identifying the server selected transmission path for each of the clients" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform sending as claimed.
8. A wireless network system as recited in claim 7, wherein said server process is further configured to: compare a selected link from said client to said server to a current client link entry in said client link tree; and update said client link tree when said comparison meets predetermined conditions.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
9. A wireless network system as recited in claim 7, wherein said server process is further configured to: determine if said client is authentic; determine if said client is already in said client link tree if client is determined to be authentic; delete said client from said client link tree if said client is authentic and is already in said client link tree; and insert said client in said client link tree if said client is authentic and is not already in said client link tree.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.
10. The wireless network system of claim 7, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. Also, the terms "client link entries correspond to" is indefinite because it is unclear what represents an entry and the scope of the claimed correspondence.
11. A method for providing wireless network communication comprising: utilizing a server implementing a server process including receiving data packets via RF transmission, sending data packets via RF	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite. The limitation "housekeeping functions" is indefinite as it cannot be reasonably ascertained what constitutes a housekeeping function, and the specification fails to adequately disclose the scope of such functions.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
transmission, communicating with a network, and performing housekeeping functions; and utilizing a plurality of clients, each client providing a client process including sending and receiving data packet via RF transmission, maintaining a send/receive data buffer in digital memory, and	
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the clients's actions in selecting cannot be reasonably ascertained.
wherein the server process: receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a server process, as claimed, that "determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, [and] sends information identifying the server selected transmission path for each of the clients to the

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
sends information identifying the server selected transmission path for each of the clients to the respective clients; and	respective clients." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a

The '496 Patent – Claims	
	routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these

The '496 Patent – Claims	
	concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses a server that determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server

The '496 Patent – Claims	
	optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues."

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
	To the extent SIPCO argues that the claim covers server optimization of paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the server selected path limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform determining server selected paths as claimed. Moreover, to the extent that SIPCO contends that the claimed selection can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Moreover, the limitation "sends information identifying the server selected transmission path for each of the clients to the respective clients" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "information identifying the server selected transmission path' is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "sends information identifying the server selected

The '496 Patent – Claims	
	transmission path for each of the clients to the respective clients" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "information identifying the server selected transmission path for each of the clients" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform sending as claimed.
maintains a client link tree having client link entries representing each of the plurality of clients.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a client link tree having client link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a client link tree having client link entries. Also, the terms "client link tree" and "client link entries representing" are indefinite because it is unclear what represents a tree, an entry, and the scope of the claimed representativeness.
12. A method for providing wireless network communication comprising: utilizing a server implementing a server process including receiving	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite. The limitation "housekeeping functions" is indefinite as it cannot be reasonably

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
data packets via RF transmission, sending data packets via RF transmission, communicating with a network, and performing housekeeping functions; and utilizing a plurality of clients, each client providing a client process including sending and receiving data packet via RF transmission, maintaining a send/receive data buffer in digital memory, and	ascertained what constitutes a housekeeping function, and the specification fails to adequately disclose the scope of such functions.
selecting a transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the clients's actions in selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
wherein said server process further includes maintaining a client link tree	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written

The '496 Patent – Claims	
having client link entries representing each of the plurality of clients, and wherein the server process:	description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a client link tree having client link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a client link tree having client link entries. Also, the terms "client link tree" and "client link entries representing" are indefinite because it is unclear what represents a tree, an entry, and the scope of the claimed representativeness.
receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the server selected transmission path, and sends information identifying the server selected transmission path for each of the clients to the respective clients.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a server process, as claimed, that "determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the server selected transmission path, and sends information identifying the server selected transmission path for each of the clients to the respective clients." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at

The '496 Patent – Claims	
	least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the

The '496 Patent – Claims	
	wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this

The '496 Patent – Claims	
	path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses a server that determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then

The '496 Patent – Claims	
	sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server optimization of paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the server selected path limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not

The '496 Patent – Claims	
	clearly perform determining server selected paths as claimed. Moreover, to the extent that SIPCO contends that the claimed selection can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Moreover, the limitation "sends information identifying the server selected transmission path for each of the clients to the respective clients" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "information identifying the server selected transmission path' is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "sends information identifying the server selected transmission path for each of the clients to the respective clients" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "sends information identifying the server selected transmission path for each of the clients" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm

The '496 Patent – Claims	
	that performs each of the claimed functions, and the disclosed algorithms do not clearly perform sending as claimed.
13. A method as recited in claim 12, wherein said server process further includes: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when said comparison meets predetermined conditions.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.
14. A method as recited m claim 12, wherein said server process further includes: determining is said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is authentic and is already in said client link tree; and inserting said client in said client link	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
tree if said client is authentic and is not already in said client link tree.	
15. The method of claim 12, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. Also, the term "client link entries correspond to" is indefinite because it is unclear what represents an entry and the scope of the claimed correspondence.
16. A method for providing wireless network communication comprising the steps of: a server process including a data packet reception step, a data packet transmission step, a network communication step, and a housekeeping step; and a plurality of clients each providing a client process including a data sending and receiving step, a send and receive data buffer maintenance step, and	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite. The limitation "housekeeping step" is indefinite as it cannot be reasonably ascertained what constitutes a housekeeping step, and the specification fails to adequately disclose the scope of such functions.
a transmission path selection step wherein the transmission path is one of a direct link to a server and an indirect link to said server through at	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention.

The '496 Patent – Claims	
least one of the remainder of said plurality of clients,	The specification of the '496 patent does not clearly link the claimed functions associated with the path selection limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform path selection as claimed. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
wherein the server process: receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, sends information identifying the server selected transmission path for each of the clients to the respective clients; and	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a server process, as claimed, that "determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, sends information identifying the server selected transmission path for each of the clients to the respective clients." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to

The '496 Patent – Claims	
	control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication

The '496 Patent – Claims	
	path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7

The '496 Patent – Claims	
	currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses a server that determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example

The '496 Patent – Claims	
	refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server optimization of paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the server selected path limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform determining server selected paths as claimed.

The '496 Patent – Claims	
	Moreover, to the extent that SIPCO contends that the claimed selection can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Moreover, the limitation "sends information identifying the server selected transmission path for each of the clients to the respective clients" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "information identifying the server selected transmission path' is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "sends information identifying the server selected transmission path for each of the clients to the respective clients" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "sends information identifying the server selected transmission path for each of the clients" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not

The '496 Patent – Claims	
	clearly perform sending as claimed.
maintains a client link tree having client link entries representing each of the plurality of clients.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a client link tree having client link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a client link tree having client link entries. Also, the terms "client link tree" and "client link entries representing" are indefinite because it is unclear what represents a tree, an entry, and the scope of the claimed representativeness.
17. A method for providing wireless network communication comprising the steps of: a server process including a data packet reception step, a data packet transmission step, a network communication step, and a housekeeping step; and a plurality of clients each providing a client process including a data sending and receiving step, a send and receive data buffer maintenance step, and	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite. The limitation "housekeeping step" is indefinite as it cannot be reasonably ascertained what constitutes a housekeeping step, and the specification fails to adequately disclose the scope of such functions.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
a link selection step wherein the transmission path is one of a direct link to a server and an indirect link to said server through at least one of the remainder of said plurality of clients,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the link selection limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform link selection as claimed. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
wherein said server process further comprises the step of maintaining a client link tree having client link entries representing each of the plurality of clients, and	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a client link tree having client link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a client link tree having client link entries. Also, the terms "client link tree" and "client link entries representing" are indefinite because it is unclear what represents a tree, an entry, and the scope of the claimed representativeness.
wherein the server process:	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the

The '496 Patent – Claims	
receives information identifying the selected transmission path from each of the plurality of clients, determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the server selected transmission path, and sends information identifying the server selected transmission path for each of the clients to the respective clients.	claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a server process, as claimed, that "determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, updates the client link entries to provide the server selected transmission path, and sends information identifying the server selected transmission path for each of the clients to the respective clients." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64.

The '496 Patent – Claims	
	"It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is

The '496 Patent – Claims	
	upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through

The '496 Patent – Claims	
	server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses a server that determines a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct

The '496 Patent – Claims	
	path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server optimization of paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the server selected path limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform determining server selected paths as claimed. Moreover, to the extent that SIPCO contends that the claimed selection can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062

The '496 Patent – Claims	
	patent at 9:11-16. Moreover, the limitation "sends information identifying the server selected transmission path for each of the clients to the respective clients" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "information identifying the server selected transmission path' is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "sends information identifying the server selected transmission path for each of the clients to the respective clients" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "sends information identifying the server selected transmission path for each of the clients" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform sending as claimed.
18. A method as recited m claim 17, wherein said server process further comprises the steps of: comparing a selected link from said client to said server to a current client link entry in said client link tree; and updating said client link tree when	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
said comparison meets predetermined conditions.	Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.
19. A method as recited in claim 17, wherein said server process further comprises steps of: determining if said client is authentic; determining if said client is already in said client link tree if client is determined to be authentic; deleting said client from said client link tree if said client is authentic and is already in said client link tree; and inserting said client into said client link tree if said client is authentic and is not already in said client link tree.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.
20. The method of claim 17, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. Also, the term "client link entries correspond to" is indefinite because it is unclear what represents an entry and the scope of the claimed correspondence.
21. A wireless network system	This claim is invalid under 35 U.S.C. § 112.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
comprising: a first node including a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling of said first node radio modem, said first node process including receiving and transmitting data packets via said first node radio modem; a plurality of second nodes each including a second node controller implementing a second node process that includes controlling a second node radio modem, said second node process including receiving and transmitting data packets via said second node radio modem,	
wherein said second node process of each of said second nodes includes initiating a radio transmission path to said first node that is a link to said first node through at least one of the remainder of said plurality of second nodes,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the initiating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform initiating as claimed. Additionally, this element is indefinite, as the scope of the second node's actions in initiating cannot be reasonably ascertained.

The '496 Patent – Claims	
wherein said first node process dynamically updates a second node link tree comprising second node link entries representing each of the plurality of second nodes and dynamically modifies the second node link tree so that the data packet transmission path to the first node is optimized.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a first node process, as claimed, that "dynamically modifies the second node link tree so that the data packet transmission path to the first node is optimized." Instead, the specification discloses that the clients select paths to the server and the clients optimize those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission.

The '496 Patent – Claims	
	In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67.

The '496 Patent – Claims	
	"As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without

The '496 Patent – Claims	
	the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a first node process, as claimed, dynamically modifies the second node link tree so that the data packet transmission path to the first node is optimized. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server

The '496 Patent – Claims	
	are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers a first node that optimizes paths, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the first node's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the dynamically modifying limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform dynamically modifying as claimed. The optimization recitation also renders the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a first node as claimed. In fact, the specification effectively admits that a multi-factor algorithm is not

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
	disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Also, the term "second node link entries representing" is indefinite because it is unclear what represents an entry and the scope of the claimed representativeness.
22. A wireless network system as recited in claim 21, wherein at least one of the second nodes is a mobile device and said first node process further comprises: logic comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and logic dynamically updating said second node link tree when said comparison meets predetermined conditions.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.
23. A wireless network system as recited in claim 21, wherein said first	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim.

The '496 Patent – Claims	
node process further comprises: logic determining if one of the plurality of said second nodes is authentic; logic determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; and logic inserting one of the plurality of said second nodes in said second node link tree if one of the plurality of said second nodes is authentic and is not already in said second node link tree.	The specification of the '496 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.
24. In a wireless system comprising a plurality of second nodes, each second node implementing a second node process including sending and receiving data packet via a second node wireless radio, maintaining a send/receive data buffer in a digital memory, and	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this preamble renders the claim indefinite. The transition of the claim is unclear, and it is not ascertainable what category of statutory subject matter that the claim is directed to (e.g., a method or apparatus). Moreover, it is unclear whether an accused infringer or prior art reference needs to include the recited features of the system found in the preamble, as the body of the claim does not make clear which features of the system are related to the features recited in the body of the claim.
selecting a link to a first node that is one of a direct link to said first node	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written

The '496 Patent – Claims	
and an indirect link to said first node through at least one of the remainder of said plurality of second nodes,	description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the second node's actions in selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
a first node configured to implement a first node process, the first node process including: receiving data packets via a first node wireless radio; sending data packets via said wireless radio; communicating with a network; performing node link tree housekeeping functions;	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite. The limitation "housekeeping functions" is indefinite as it cannot be reasonably ascertained what constitutes a node link tree housekeeping function, and the specification fails to adequately disclose the scope of such functions.
maintaining a second node link tree having second node link entries representing each of the plurality of second nodes;	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a second node link tree having second node link entries" limitation to a

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
	disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a second node link tree having second node link entries. Also, the term "second node link entries representing" is indefinite because it is unclear what represents an entry and the scope of the claimed representativeness.
dynamically updating the tree to reflect the current operational status of the second nodes; and rerouting data packets around inactive or malfunctioning second nodes.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a first node process "dynamically updating the tree to reflect the current operational status of the second nodes; and rerouting data packets around inactive or malfunctioning second nodes." Instead, the specification discloses that the client selects paths to the server and the clients optimize those paths by rerouting around inactive or malfunctioning nodes. The following portions of the specification support that the clients reroute data packets (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6.

The '496 Patent – Claims	
	"If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at

The '496 Patent – Claims	
	9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream'

The '496 Patent – Claims	
	from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a server performs rerouting of data packets in the manner claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path.

The '496 Patent – Claims	
	Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers a server that reroutes data packets, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the dynamically updating and rerouting limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform dynamically updating and rerouting as claimed. Moreover, to the extent that SIPCO contends that the claimed rerouting can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at the server.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
	In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.
25. The first node of claim 24, wherein the first node process further includes: comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and dynamically updating said second node link tree when said comparison meets predetermined conditions.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.
26. The first node of claim 24, wherein the first node process further includes: determining if one of the plurality of said second nodes is authentic; determining if one of the plurality of said second nodes is already in said	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
second node link tree if one of the plurality of said second nodes is determined to be authentic; deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is authentic and is already in said second node link tree; and inserting one of the plurality of said second nodes in said second node link tree if said second node is authentic and is not already in said client link tree.	with authentication as claimed.
27. In a wireless system comprising a plurality of second nodes and a first node configured to implement a first node process, the first node process including receiving data packets via a first node wireless radio, sending data packets via said wireless radio, communicating with a network, performing node link tree housekeeping functions,	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this preamble renders the claim indefinite. The transition of the claim is unclear, and it is not ascertainable what category of statutory subject matter that the claim is directed to (e.g., a method or apparatus). Moreover, it is unclear whether an accused infringer or prior art reference needs to include the recited features of the system found in the preamble, as the body of the claim does not make clear which features of the system are related to the features recited in the body of the claim. The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite. The limitation "housekeeping functions" is indefinite as it cannot be reasonably

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
	ascertained what constitutes a node link tree housekeeping function, and the specification fails to adequately disclose the scope of such functions.
maintaining a second node link tree having second node link entries representing each of the plurality of second nodes,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a second node link tree having second node link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a second node link tree having second node link entries. Also, the term "second node link entries representing" is indefinite because it is unclear what represents an entry and the scope of the claimed representativeness.
dynamically updating the tree to reflect the current operational status of the second nodes, and rerouting data packets around inactive or malfunctioning second nodes, a second node in the plurality of second nodes,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a first node process "dynamically updating the tree to reflect the current operational status of the second nodes, and rerouting data packets around inactive or malfunctioning second nodes, a second node in the plurality of second nodes." Instead, the specification discloses that the client selects paths to the server and the clients optimize those paths by rerouting around inactive or malfunctioning nodes. The following portions of the specification support that the clients reroute data packets (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents):

The '496 Patent – Claims	
	"A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at

The '496 Patent – Claims	
	8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28

The '496 Patent – Claims	
	"In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses that a server performs rerouting of data packets in the manner claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
	introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers a server that reroutes data packets, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
	functions associated with the dynamically updating and rerouting limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform dynamically updating and rerouting as claimed. Moreover, to the extent that SIPCO contends that the claimed rerouting can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at the server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.
the second node configured to implement a second node process including: sending and receiving data packet via a second node wireless radio; maintaining a send/receive data buffer in a digital memory; and selecting a link to the first node that is one of a direct link to the first node and an indirect link to the first node through at least one of the remainder of the plurality of second nodes.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the second node's actions in selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this

The '496 Patent – Claims	
	limitation fails to provide a meaningful limitation to the claimed network.
33. In a wireless network system comprising a plurality of second nodes each including a second node controller configured to implement a second node process that includes controlling a second node radio modem, receiving and transmitting data packets via said second node radio modem, and	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this preamble renders the claim indefinite. It is unclear whether an accused infringer or prior art reference needs to include the recited features of the system and second node found in the preamble, as the body of the claim does not make clear which features of the system and second node are related to the features recited in the body of the claim.
initiating a radio transmission path to a first node that is a direct link to said first node through at least one of the remainder of said plurality of second nodes,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the initiating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform initiating as claimed. Additionally, this element is indefinite, as the scope of the second node's actions in selecting cannot be reasonably ascertained. The claim is indefinite because a path "through at least one of the remainder of said plurality of second nodes" would be understood by a person of ordinary skill in the art to be an indirect path, and a "direct" link would be understood as passing "through" another peer node. Yet, the claim recites that the "direct" link is "through at least one of the remainder of said plurality of second nodes." That the claim confuses understood meanings of "direct" and "indirect" renders the claim indefinite.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
the first node comprising: a first node controller; and a first node radio modem, wherein said first node controller is configured to implement a first node process comprising: controlling said first node radio modem; receiving and transmitting data packets via said first node radio modem; and maintaining a second node link tree comprising second node link entries representing each of the plurality of second nodes.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a second node link tree having second node link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a second node link tree having second node link entries. Also, the term "second node link entries representing" is indefinite because it is unclear what represents an entry and the scope of the claimed representativeness.
34. A wireless network system as recited in claim 33, wherein said first node process further comprises: comparing a selected link from one of the plurality of said second nodes to said first node to a current second node link entry in said second node link tree; and updating said second node link tree when said comparison meet predetermined conditions.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meet predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition and how it is predetermined, and the specification fails to adequately disclose how such function is performed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
35. A wireless network system as recited in claim 33, wherein said first node process further comprises: determining if one of the plurality of said second nodes is authentic; determining if one of the plurality of said second nodes is already in said second node link tree if one of the plurality of said second nodes is determined to be authentic; and inserting one of the plurality of said second nodes in said second node link tree if one of the plurality of said second nodes is authentic and is not already in said client link tree.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.
36. In a wireless network system comprising a plurality of second nodes and a first node, the first node comprising a first node controller and a first node radio modem, wherein said first node controller is configured to implement a first node process that includes controlling said first node radio modem, receiving and transmitting data packets via said first	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this preamble renders the claim indefinite. It is unclear whether an accused infringer or prior art reference needs to include the recited features of the system and first node found in the preamble, as the body of the claim does not make clear which features of the system and first node are related to the features recited in the body of the claim.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
node radio modem, and	
maintaining a second node link tree comprising second node link entries representing each of the plurality of second nodes, at least one second node in the plurality of second nodes comprising:	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a second node link tree having second node link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a second node link tree having second node link entries. Also, the term "second node link entries representing" is indefinite because it is unclear what represents an entry and the scope of the claimed representativeness.
a second node controller configured to implement a second node process that includes controlling a second node radio modem, receiving and transmitting data packets via said second node radio modem, initiating a radio transmission path to a first node that is a direct link to said first node through at least one of the remainder of said plurality of second nodes.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the initiating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform initiating as claimed. Additionally, this element is indefinite, as the scope of the second node's actions in selecting cannot be reasonably ascertained. The claim is indefinite because a path "through at least one of the remainder of said plurality of second nodes" would be understood by a person of ordinary skill in the art to be an indirect path, and a "direct" link would be understood as passing "through" another peer node. Yet, the claim recites that the "direct" link is "through at least one of the remainder of said plurality of second nodes." That the claim confuses

The '496 Patent – Claims	
	understood meanings of "direct" and "indirect" renders the claim indefinite.
37. A method for providing wireless network communication comprising: implementing in a first node a first node process including receiving data packets via R.F. transmission and sending data packets via R.F. transmission; implementing in each of a plurality of second nodes a second node process including sending and receiving data packet via R.F. transmission, maintaining a send/receive data buffer in digital memory, and	This claim is invalid under 35 U.S.C. § 112.
selecting a transmission path to said first node that is one of a direct link to said first node and an indirect link to said first node through at least one of the remainder of said plurality of second nodes; and	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform selecting as claimed. Additionally, this element is indefinite, as the scope of the second node's actions in selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is

The '496 Patent – Claims	
	not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
maintaining a second node link tree having second node link entries representing each of the plurality of second nodes at the first node.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a second node link tree having second node link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a second node link tree having second node link entries. Also, the term "second node link entries representing" is indefinite because it is unclear what represents an entry and the scope of the claimed representativeness.
38. A method as recited in claim 37, wherein said first node process further includes: comparing a selected link from one of the plurality of said second nodes to said first node to a second node link entry in said second node link tree; and updating said second node link tree when said comparison meets at least one of several predetermined conditions.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the comparing and updating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform comparing and updating as claimed. Moreover, the limitation "meets at least one of several predetermined conditions meets predetermined conditions" is indefinite as it cannot be reasonably ascertained what constitutes a condition, how it is predetermined, what the "several" conditions are, and whether they need to be simultaneously met, and the specification fails to

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
	adequately disclose how such function is performed.
39. A method as recited in claim 37, wherein said first node process further includes: determining if one of the plurality of said second nodes is authentic; deleting one of the plurality of said second nodes from said second node link tree if one of the plurality of said second nodes is authentic and is already in said second node link tree; and inserting one of the plurality of said second nodes in said second node tree if said second node is authentic and is not already in said client link tree.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. The specification of the '496 patent does not clearly link the claimed functions associated with the authentication (i.e., determining, deleting, inserting) limitations to a disclosed algorithm that performs each of the claimed functions in the manner claimed, and the disclosed algorithms do not clearly perform the functions associated with authentication as claimed.
40. In a network including a plurality of client nodes having a client radio modem and a client controller which implements a client process including receiving and transmitting data packets via said client node to other nodes in the network, a server node comprising:	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this preamble renders the claim indefinite. It is unclear whether an accused infringer or prior art reference needs to include the recited features of the clients found in the preamble, as the body of the claim does not make clear which features of the client are related to the features recited in the body of the claim.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
a server node radio modem; and a server node controller implementing a server process, said server process configured to:	
receive information identifying selected transmission paths from each of the plurality of client nodes, wherein said transmission path is one of a direct link to the server node and an indirect link to said server node through at least one other client node; determine a server selected transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes; send information identifying the server selected transmission path for each of the plurality of client nodes to the respective client node; and	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a server process, as claimed, configured to "determine a server selected transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes; [and] send information identifying the server selected transmission path for each of the plurality of client nodes to the respective client node." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has

The '496 Patent – Claims	
	less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35.

The '496 Patent – Claims	
	"In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7.

The '496 Patent – Claims	
	"In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses a server that determines a server selected transmission path for each of the plurality of client nodes based on the selected transmission paths received from the plurality of client nodes, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only

The '496 Patent – Claims	
	that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server optimization of paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the server selected path limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform determining server selected paths as claimed. Moreover, to the extent that SIPCO contends that the claimed selection can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not

The '496 Patent – Claims	
	disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Moreover, the limitation "send information identifying the server selected transmission path for each of the plurality of client nodes to the respective client node" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "information identifying the server selected transmission path" is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "sends information identifying the server selected transmission path for each of the clients to the respective clients" renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "send information identifying the server selected transmission path for each of the plurality of client nodes" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform sending as claimed. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
maintain a client link tree having client link entries representing each of the plurality of client nodes.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the maintaining "a client link tree having client link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a client link tree having client link entries. Also, the terms "client link tree" and "client link entries representing" are indefinite because it is unclear what represents a tree, an entry, and the scope of the claimed representativeness.
41. The server node of claim 40, wherein the server process is further configured to perform gateway functions.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the gateway functions limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform gateway functions as claimed. Moreover, the limitation "perform gateway functions" is indefinite as it cannot be reasonably ascertained what constitutes a gateway function, and the specification fails to adequately disclose how such function is performed.
42. A server for use in a wireless	This claim is invalid under 35 U.S.C. § 112.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
network system including a plurality of clients each including a client controller and a client radio modem, said client controller implementing a client process that includes controlling said client radio modem, receiving and transmitting data packets via said client radio modem,	The claim is invalid under 35 U.S.C. § 112(b) as this preamble renders the claim indefinite. It is unclear whether an accused infringer or prior art reference needs to include the recited features of the system and clients found in the preamble, as the body of the claim does not make clear which features of the system and clients are related to the features recited in the body of the claim.
wherein said client process of each of said clients initiates and selects a radio transmission path to said server that is one of a direct link to said server and an indirect link to said server through at least one the remainder of said plurality of clients,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the initiating and selecting limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform initiating and selecting as claimed. Additionally, this element is indefinite, as the scope of the clients's actions in initiating and selecting cannot be reasonably ascertained. The limitation "one of a direct link … and an indirect link" renders the claim indefinite. Specifically, requiring that the route either to be a "direct link" or an "indirect link" is not in any way limiting. For a "link" to exist, it must be either direct or not. Thus, this limitation fails to provide a meaningful limitation to the claimed network.
said server comprising: a server controller and a server radio modem, said server controller implementing a server process that	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the

The '496 Patent – Claims	
includes the controlling of said server radio modem, receiving and transmitting of data packets via said server radio modem, maintaining a client link tree having client link entries representing each of the plurality of clients, and	maintaining "a client link tree having client link entries" limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly "maintain" a client link tree having client link entries. Also, the terms "client link tree" and "client link entries representing" are indefinite because it is unclear what represents a tree, an entry, and the scope of the claimed representativeness.
receiving information identifying the selected transmission path from each of the plurality of clients, determining a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, and sending information identifying the server selected transmission path for each of the clients to the respective clients.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a server controller, as claimed, for "determining a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, and sending information identifying the server selected transmission path for each of the clients to the respective clients." Instead, the specification discloses that the clients select paths to the server and the clients change those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network.

The '496 Patent – Claims	
	The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing

The '496 Patent – Claims	
	through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client

The '496 Patent – Claims	
	7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses a server controller for determining a server selected transmission path for each of the plurality of clients based on the selected transmission paths received from the plurality of clients, as claimed. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the

The '496 Patent – Claims	
	digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers server optimization of paths of clients, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the server's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the server selected path limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform determining server selected paths as claimed.

The '496 Patent – Claims	
	Moreover, to the extent that SIPCO contends that the claimed selection can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a server. In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16. Moreover, the limitation "sending information identifying the server selected transmission path for each of the clients to the respective clients" is indefinite as it cannot be reasonably ascertained what, and to which clients the, "information identifying the server selected transmission path" is sent, and the specification fails to adequately disclose how such function is performed. Moreover, the limitation "sending information identifying the server selected transmission path for each of the clients to the respective clients " renders the claim invalid as indefinite and invalid as the specification lacks a sufficient written description to enable the full scope of the claimed invention. In particular, it is unclear as to whether "information identifying the server selected transmission path for each of the clients" is sent to one client, or to all clients, and the specification lacks sufficient guidance to resolve this ambiguity and lacks an adequate disclosure for such a recitation. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the sending limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform sending as claimed.

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
44. The server of claim 42, wherein the client link entries correspond to the server selected transmission path between the server and the respective client.	This dependent claim is invalid for failing to meet the requirements of 35 U.S.C. § 112(a) and (b) for at least the reasons stated with regard to its base claim. Also, the term "client link entries correspond to" is indefinite because it is unclear what represents an entry and the scope of the claimed correspondence.
45. A first node for use in wireless network system including a plurality of second nodes each including a second node controller implementing a second node process that includes controlling a second node radio modem, receiving and transmitting data packets via said second node radio modem,	This claim is invalid under 35 U.S.C. § 112. The claim is invalid under 35 U.S.C. § 112(b) as this preamble renders the claim indefinite. It is unclear whether an accused infringer or prior art reference needs to include the recited features of the system and second nodes found in the preamble, as the body of the claim does not make clear which features of the system and second nodes are related to the features recited in the body of the claim.
wherein said second node process of each of said second nodes includes initiating a radio transmission path to said first node that is a link to said first node through at least one of the remainder of said plurality of second nodes,	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the '496 patent does not clearly link the claimed functions associated with the initiating limitations to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform initiating as claimed. Additionally, this element is indefinite, as the scope of the second node's actions in initiating cannot be reasonably ascertained.

The '496 Patent – Claims	
said first node comprising: a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling said first node radio modem, receiving and transmitting data packets via said first node radio modem, and dynamically updating a second node link tree comprising second node link entries representing each of the plurality of second nodes so that the data packet transmission path to the first node is optimized.	The claim is invalid under 35 U.S.C. § 112(b) as this limitation is indefinite, and the claim is invalid under 35 U.S.C. § 112(a) as the specification lacks a sufficient written description to enable the full scope of the claimed invention. The specification of the Brownrigg family patents, as originally filed, fails to sufficiently disclose a first node process that includes "dynamically updating a second node link tree comprising second node link entries representing each of the plurality of second nodes so that the data packet transmission path to the first node is optimized." Instead, the specification discloses that the clients select paths to the server and the clients optimize those paths. The following portions of the specification support that the clients "optimize" the path (although the citations are made to the '062 patent for simplicity, similar citations can be found in the other Brownrigg patents): "A network client for a wireless communication network of the present invention includes a radio modem capable of communicating with at least one server and at least one additional client, and a digital controller coupled to the radio modem to control the sending and receiving of data packets. The digital controller is further operative to determine an optimal path to at least one server of the wireless network. The optimal path can be either a direct path to the server, or an indirect path to the server through at least one additional client." '062 patent at 5:64-6:6. "If client 18C detects the transmissions of client 18D, it will note that client 18D has less "hops" to the server 16 than does client 18B, and will switch its link from client 18B to client 18D. This process is a part of the 'stabilization' or 'optimization' process of the network 10." '062 patent at 8:59-64. "It will therefore be appreciated that the wireless network system 10 of the present

The '496 Patent – Claims	
	invention is constantly attempting to optimize itself for the "best" data transmission. In the embodiment described herein, this optimization looks solely to the number of hops between the client and the server for the sake of simplicity. However, other factors can also affect the quality of the data transmission. For example, the traffic of data packets through a particular client modem may be large, such that it is better to route the data from neighboring clients through other clients, even though there may be more hops involved with this alternative routing. Also, some radio links may be less robust or may be slower than other links, such that optimization may result in a routing of data around the less robust or slower links, even though it may increase the number of hops to the server 16. Therefore, although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 8:65-9:16. "For example, if the client 18D is a portable computer and is moved around within the wireless network system 10, it will opportunistically change its data communication path as better links become available. For example, if the client 18D is moved close to the client 18B, it may use the client 18B as its link to the server 16. Also, any routing through the client 18D from other clients (such as 18C in this example) will be updated and optimized as the data path for the client 18D changes." '062 patent at 9:26-35. "In the scenario where client 18C realizes it has a better connection to server 16 through the client 18D, the link 30 to client 18B is no longer used, and a new radio link 34 to client 18D is established. This is illustrated in FIG. 1b. Now, clients 18A and 18B remain 1 hop clients, clients 18B remains a 2 hop client, but client 18C is upgraded from a 3 hop client to a 2 hop client. Therefore, the data transmission

The '496 Patent – Claims	
	efficiency of the network has been 'stabilized' or 'optimized.'" '062 patent at 9:59-67. "As noted in this figure, client 7 has made the adjustment to connect to server 26, thereby 'stabilizing' or 'optimizing' the network 26. Also, it should be noted that server 14 has deleted client 7 from its routing table, since client 7 is now using server 26 as its gateway to the Internet. This creates a universe of six nodes, of which are two are servers and of which are four are clients. The average 'hop' distance from a client to a server is 1.5 hops. The remainder FIGS. 26g-26o further illustrate these concepts." '062 patent at 11:5-17. "As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission from other clients that have a better (i.e. shorter) path to a server." '062 patent at 11:25-28 "In FIG. 2k, the 'stabilization' or 'optimization' process is illustrated. It was previously noted that the client 29 has a non-optimal path to its server. In order to improve this path, client 29 will receive "help" from its neighbors starting with client 7. Client 7 currently has a route to server 14. Client 7 starts randomly probing its neighbors looking for a shorter route to a server. Client 7 finds a shorter route to client 26. Client 7 informs server 14 to drop client 7 from server 14's routing table, and client 7 informs server 26 to add client 7 to its routing table. Since client 29 was 'downstream' from client 07, client 29 dynamically becomes switched to a route to server 26." '062 patent at 11:63-12:7. "In FIG. 2n, client 29 is optimizing its path. Client 29 eliminates 18 from its route by 'leap frogging' past client 18 with the result of the shortest possible 3 hop route to a server. Ultimately, therefore, client 29 route has improved from a 7 hop path through server 14 to the shortest possible 3 hop path to server 26. This result is dynamically

The '496 Patent – Claims	
	accomplished with the efficiencies of client 7, 8, and 18 also improving, and without the need for complex routing algorithms." '062 patent at 12:14-21. In contrast, nothing in the Brownrigg patents discloses a first node process, as claimed, that dynamically updates a second node link tree comprising second node link entries representing each of the plurality of second nodes so that the data packet transmission path to the first node is optimized. Moreover, on October 14, 2008, the patent owner sought claims directed to server optimization. On December 16, 2008, the USPTO did not permit such claims to be added, stating, "The proposed amendment filed 10/14/2008 introduces 'server process' steps into each independent claim and which steps are suggested as being supported via col.5,ln.25-col.6,ln.14, col.9,ln.45-col.12,ln.12 and figures 1 a-2o. The specific passages of the patent cited for support of such server process as introduced by the amendment do not recite the server process receiving the selected transmission path and determining an optimized path based thereon and then sending such optimized path to each of the clients. Instead, col 5, ln.29-38 for example refers to the client choosing a 'best' link to the server; col.5,ln.55-63 refers to the digital controller of the server which allows a client to maintain and upgrade a path to the server; and col.6,ln.2-3 refers to the digital controller of the client determining an optimal path. Likewise, the description in col.9,ln.45-col.12,ln.12 and figures 1 a-2o describe only that a 'tree structure is maintained in the server S, and is transmitted to any client that may request it.' (col.9,ln.47-49). However, the remaining portion of the description continues with an explanation of figures 2a-2o (beginning on col.10,ln.8) where the client requests a route to the server, the server responds (if it is in direct

Exhibit B112 – Invalidity Chart for Brownrigg Family Based on Failure to Comply with 35 U.S.C. § 112

The '496 Patent – Claims	
	path with the server) and adds the client to its routing table in a direct route to the server (col.10,ln.30-40). Second and third clients with indirect routes to the server are described in col.10,ln.41-61, but those clients interact with another client, no description of the server determining an optimized path based on the selection from the client, nor the sending of such optimized path from the server to each of the clients is provided in the recited passages of the specification. As such the proposed amendment to the claims raises new issues." To the extent SIPCO argues that the claim covers a first node that optimizes paths, the specification fails to enable the full scope of the claimed invention. Additionally, this element is indefinite, as the scope of the first node's actions cannot be reasonably ascertained. Moreover, the specification of the '496 patent does not clearly link the claimed functions associated with the dynamically modifying limitation to a disclosed algorithm that performs each of the claimed functions, and the disclosed algorithms do not clearly perform dynamically modifying as claimed. The optimization recitation also renders the claim indefinite because the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. In particular, it is unclear what would be regarded as "optimal," as such is a subjective standard that varies based on individual preferences. Moreover, to the extent that SIPCO contends that the claimed optimization can involve multiple factors, the specification fails to disclose or enable an optimization algorithm of that employs multiple factors in an optimization process, particularly at a first node as claimed.

The '496 Patent – Claims	
	In fact, the specification effectively admits that a multi-factor algorithm is not disclosed, even for its client-optimization process, stating "although the present preferred embodiment looks at only one single factor in its optimization processes, it will be appreciated by those skilled in the art that multiple factors can be used to stabilize or optimize the wireless network system 10 of the present invention." '062 patent at 9:11-16.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 7,697,492 based on Kahn

The '492 Patent – Claim	Kahn, "*Advances in Packet Radio Technology*", Proceedings of the IEEE, Vol. 66, No. 11, November 1978.
1. In a communication system to communicate command and sensed data between remote devices, the system comprising:	"Packet radio (PR) is a technology that extends the application of packet switching which evolved for networks of point-to-point communication lines to the domain of broadcast radio. It offers a highly efficient way of using a multiple access radio channel with a potentially large number of mobile subscribers to support computer communication and to provide local distribution of information over a wide geographic area." Kahn Abstract.
a receiver address comprising a scalable address of at least one remote device;	"Each radio has an identifier which we shall call its selector. The selectors play a central role in the network routing and control procedures." Kahn page 1479 "In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header. Alternatively, the station can send it directly to the digital section of the sender's (or receiver's) packet radio. In this case, each packet originating at that radio could then contain the entire set of selectors in its header." Kahn page 1479.

	"Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, page 1490. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR,

	encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules

	belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39.

	"FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source

	Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a command indicator comprising command code;	"SPP is an end-to-end protocol which is used for reliable delivery of network monitor and control packets, such as labelling packets sent to an EPR." Kahn page 1490. "The half duplex operation is keyed to a nominal cycle of packet transmission, acknowledgment receipt, new packet receipt, followed then by its transmission and acknowledgement (see Fig. 7)." Kahn page 1478. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247.

	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses:

	"Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination

	addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a data value comprising a scalable message; and	Fig. 8 page 1479. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR,

	encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules

	belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39.

	"FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source

	Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a controller associated with a remote device comprising a transceiver configured to send and receive wireless signals, the remote device configured to send a preformatted message comprising the receiver address, a command indicator, and the data value via the transceiver to at least one other remote device.	Fig. 6. "An individual packet radio is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation. The digital section contains a microprocessor controller plus semiconductor memory for packet buffering and software. The radio and digital sections area connected by a high speed interface (see Fig. 6)." Kahn page 1477. "Normal store-and-forward operation within the network takes

	place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of his packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet. Upon correct receipt of the packet, the nearby repeater processes the header to determine if it should relay the packet, deliver it to an attached device, or discard it." Kahn page 1477. Fig. 8, Kahn page 1479. "For the following discussion, we refer to the operation of an experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48 bit preamble followed by a variable length header (typically 96-144 bits), followed by the text and a 32 bit checksum." Kahn page 1478. Figure 12, Kahn page 1489. Figure 13, Kahn page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, page 1490.
2. The system of claim 1, further comprising:	The above contentions for claim 1 are hereby incorporated by

	reference.
a plurality of transceivers each having a unique address, the transceiver being one of the plurality of transceivers;	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of this packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet. Upon correct receipt of the packet, the nearby repeater processes the header to determine if it should relay the packet, deliver it to an attached device, or discard it. ... The packet with then be relayed from repeater to repeater through the backbone (in a store-and-forward fashion using the procedure described above) until it arrives at the final repeater which broadcasts it directly to the user's packet radio." Kahn page 1477. "Each radio has an identifier which we shall call its selector. The selectors play a central role in the network routing and control procedures." Kahn page 1479 Figure 9, Kahn page 1480 Figure 12, Kahn page 1489.
a plurality of controllers associated with each the controller	"An individual packet radio unit is a small piece of electronic

associated with at least one of the transceivers, the controller being in communication with at least one other transceiver with a preformatted message, the preformatted message having at least one scalable field;	equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation. The digital section contains a microprocessor controller plus semiconductor memory for packet buffering and software" Kahn page 1477. "For the following discussion, we refer to the operation of n experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48 bit preamble followed by a variable length header (typically 96-144 bits), followed by the text and a 32 bit checksum." To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header.

	ETE Header: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43.

	'252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition

	to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing:

	Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
at least one sensor associated with at least one of the transceivers to detect a condition and output a data signal to the transceiver; and	"1) Network Monitoring and Control: A centralized network management facility (NMF) has been developed for managing and operating the Bay Area experimental testbed. It is somewhat similar to the ARPANET network control center (NCC) [39] in that it collects and displays relevant PRNET status information on a continuous basis. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected,

	diagnosed, and isolated." Kahn page 149.
at least one actuator associated with at least one of the transceivers to activate a device.	"2) Debugging the Network: All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1495.
3. The system of claim 1, wherein the controller sends the preformatted message via an associated transceiver, and at least one transceiver sends the preformatted response message.	The above contentions for claim 1 are hereby incorporated by reference. "At each repeater, the packet is stored in memory until a positive acknowledgement is received from the next downstream repeater or a time-out occurs."
4. The system of claim 1, wherein at least one transceiver receives the preformatted message requesting sensed data, confirms the receiver address as its own unique address, receives a sensed data signal, formats the sensed data signal into scalable byte segments, determines the number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet.	The above contentions for claim 1 are hereby incorporated by reference. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of this packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet. Upon correct receipt of the packet, the nearby

	repeater processes the header to determine if it should relay the packet, deliver it to an attached device, or discard it. ... The packet with then be relayed from repeater to repeater through the backbone (in a store-and-forward fashion using the procedure described above) until it arrives at the final repeater which broadcasts it directly to the user's packet radio." Kahn page 1477. "1) TIU measurement software-provides sources and sinks of controlled traffic streams; generates and collects pickup packets; received, collects end-device CUMSTATS; and periodically sends collected data to station measurement process. … 2) PRU measurement software-collects subnet CUMSTATS and snapshots; enters local data into pickup packets; and periodically sends collected data to station measurement process. PRU CUMSTATS include counters for packets transmitted, packets received, packets in error, and retransmission histograms. 3) Station measurement software- controls experiments and collects the resulting measurement data." Kahn page 1495. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header

	corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or

	destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information

	is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59.

	'252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
6. The system of claim 1, wherein each remote device is adapted	The above contentions for claim 1 are hereby incorporated by

to transmit and receive radio frequency transmissions to and from at least one other transceiver.	reference. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of this packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet. Upon correct receipt of the packet, the nearby repeater processes the header to determine if it should relay the packet, deliver it to an attached device, or discard it. ... The packet with then be relayed from repeater to repeater through the backbone (in a store-and-forward fashion using the procedure described above) until it arrives at the final repeater which broadcasts it directly to the user's packet radio." Kahn page 1477.
8. A method of communicating command and sensed data between remote wireless devices, the method comprising:	"Packet radio (PR) is a technology that extends the application of packet switching which evolved for networks of point-to-point communication lines to the domain of broadcast radio. It offers a highly efficient way of using a multiple access radio channel with a potentially large number of mobile subscribers to support computer communication and to provide local distribution of information over a wide geographic area." Kahn Abstract.
providing a receiver to receive at least one message;	"Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, page 1490.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 7,697,492 based on Kahn

wherein the message has a packet comprising a command indicator comprising a command code, a scalable data value comprising a scalable message, and an error detector that is a redundancy check error detector; and	"For the following discussion, we refer to the operation of n experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48 bit preamble followed by a variable length header (typically 96-144 bits), followed by the text and a 32 bit checksum." Kahn page 1478. ""When a packet is to be transmitted, the processor activates a DMA channel to control and monitor the transmission. Under DMA control, the packet is read from the processor memory, convolutionally encoded with a constraint length 24 code, and loaded into a buffer prior to scrambling (bit order permutation). The packet data is read from the buffer bit by bit in pseudo random order, differentially encoded, and passed to the spread spectrum modulator where each data bit is modulo two added to each chip of the PN chip sequence used to encode that bit. …Fig. 15 shows the basic UPR packet and preamble format. In the discussion above, only the header and text bits of the packet are read from the processor memory. The preamble and postamble bits are supplied by the code generator circuitry, and are used in combination by the receiver to determine the receive data rate and coding format of the packet." "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been

	obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device.

	It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses:

	"Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses:

	"The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets:

	U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43.

	'252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the

	nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields.

	Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
providing a controller to determine if at least one received message is a duplicate message and determining a location from which the duplicate message originated.	"Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of this packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet. Upon correct receipt of the packet, the nearby repeater processes the header to determine if it should relay the packet, deliver it to an attached device, or discard it. ... The packet with then be relayed from repeater to repeater through the backbone (in a store-and-forward fashion using the procedure described above) until it arrives at the final repeater which broadcasts it directly to the user's packet radio." Kahn page 1477.
9. The method of claim 8, further comprising providing at least one remote wireless communication device, wherein at least one of the devices comprise geographically remote transceivers adapted to transmit and receive at least one message using radio frequency transmissions.	The above contentions for claim 8 are hereby incorporated by reference. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of this packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet. Upon correct receipt of the packet, the nearby

	repeater processes the header to determine if it should relay the packet, deliver it to an attached device, or discard it. ... The packet with then be relayed from repeater to repeater through the backbone (in a store-and-forward fashion using the procedure described above) until it arrives at the final repeater which broadcasts it directly to the user's packet radio." Kahn page 1477. Figure 9, Kahn page 1480. "The location of the major elements of the packet radio testing during 1977 is shown in Fig. 12." Kahn page 1488. Figure 12, Kahn page 1489.
10. The method of claim 8, further comprising providing at least one remote wireless communication device, wherein at least one of the devices has a unique address and the packet further comprises at least one scalable address field to contain the unique address for at least one device.	The above contentions for claim 8 are hereby incorporated by reference. "Each radio has an identifier which we shall call its selector. The selectors play a central role in the network routing and control procedures." Kahn page 1479. "In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the point-point routing information? One possibility is for it to distribute the information to the individual repeaters along the

	point-to-point route. In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header." Kahn page 1479. Figure 8, Kahn page 1479. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for

	routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service

	module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39.

	"FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to

	addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
11. The method of claim 8, further comprising providing an actuator associated with at least one of the remote devices, the actuator configured to actuate in response to the command code.	The above contention for claim 8 is hereby incorporated by reference. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn page 1495.
13. The method of claim 8, further comprising determining if an error exists in a packet of the at least one message.	The above contention for claim 8 is hereby incorporated by reference. "H. Error Control Data integrity is crucial for most computer applications. Error

Exhibit P1 – Invalidity Chart for U.S. Patent No. 7,697,492 based on Kahn

	control should be provided by the network, so that packets delivered to a user with undetected errors occur less frequently than about one in 1010 packets. …While detection of errors is essential, choices exist in dealing with the detected errors. In some cases, error detection and retransmission may be used, while in other environments, more sophisticated forward error correction technology must be used in order to maintain satisfactory throughput and delay when communicating through land mobile radio channels." Kahn page 1470. "For the following discussion, we refer to the operation of n experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48 bit preamble followed by a variable length header (typically 96-144 bits), followed by the text and a 32 bit checksum." Kahn page 1478. "The error control bits consist of a checksum appended by the transmitter and checked by each receiver." Kahn page 1479. Figure 8, Kahn page 1479.
14. A wireless communication device for use in a communication system to communicate command and sensed data between remote wireless communication devices, the wireless communication device comprising:	"Packet radio (PR) is a technology that extends the application of packet switching which evolved for networks of point-to-point communication lines to the domain of broadcast radio. It offers a highly efficient way of using a multiple access radio channel with a potentially large number of mobile subscribers to support computer communication and to provide local distribution of information over a wide geographic area." Kahn Abstract.
a transceiver configured to send and receive wireless communications; and	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section

	which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477.
a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to format a message comprising a receiver address comprising a scalable address of at least one remote wireless device; a command indicator comprising a command code, a data value comprising a scalable message.	Figure 6, Kahn page 1478. "An individual packet radio is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation. The digital section contains a microprocessor controller plus semiconductor memory for packet buffering and software. The radio and digital sections area connected by a high speed interface (see Fig. 6)." Kahn page 1477. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host

	computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin

	page 25-26. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be

	programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater

	functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25.

	"The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A

	tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing:

	Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
15. The wireless communication device of claim 14, further comprising at least one sensor configured to detect a condition and output a signal to the controller.	The above contentions for claim 14 are hereby incorporated by reference. "1) TIU measurement software-provides sources and sinks of controlled traffic streams; generates and collects pickup packets; received, collects end-device CUMSTATS; and periodically sends collected data to station measurement process. … 2) PRU measurement software-collects subnet CUMSTATS and

Exhibit P1 – Invalidity Chart for U.S. Patent No. 7,697,492 based on Kahn

	snapshots; enters local data into pickup packets; and periodically sends collected data to station measurement process. PRU CUMSTATS include counters for packets transmitted, packets received, packets in error, and retransmission histograms. 3) Station measurement software- controls experiments and collects the resulting measurement data." Kahn page 1495.
16. The wireless communication device of claim 14, wherein the controller is further configured to determine if at least one received message is a duplicate message and determine a location from which the duplicate message originated.	The above contentions for claim 14 are hereby incorporated by reference. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of this packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet. Upon correct receipt of the packet, the nearby repeater processes the header to determine if it should relay the packet, deliver it to an attached device, or discard it. ... The packet with then be relayed from repeater to repeater through the backbone (in a store-and-forward fashion using the procedure described above) until it arrives at the final repeater which broadcasts it directly to the user's packet radio." Kahn page 1477.
17. The wireless communication device of claim 14, further comprising at least one actuator configured to implement an action corresponding to the command code.	The above contention for claim 14 is hereby incorporated by reference. "From the station, parameters in each PR and terminal device in

Exhibit P1 – Invalidity Chart for U.S. Patent No. 7,697,492 based on Kahn

	the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn page 1495.
18. The device of claim 14, wherein the transceiver comprises a unique transceiver address to distinguish the transceiver from other transceivers.	The above contentions for claim 14 are hereby incorporated by reference. "Each radio has an identifier which we shall call its selector. The selectors play a central role in the network routing and control procedures." Kahn page 1479.
19. In a system for communicating commands and sensed data between remote devices comprising a communications device for communicating commands and sensed data, the communications device comprising:	"Packet radio (PR) is a technology that extends the application of packet switching which evolved for networks of point-to-point communication lines to the domain of broadcast radio. It offers a highly efficient way of using a multiple access radio channel with a potentially large number of mobile subscribers to support computer communication and to provide local distribution of information over a wide geographic area." Kahn Abstract.
a transceiver operably configured to be in communication with at least one other of a plurality of transceivers, wherein the transceiver has a unique address, wherein the unique address identities the individual transceiver, wherein the transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with each of the other transceivers via preformatted messages;	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of this packet radio, which adds some network

	routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet. Upon correct receipt of the packet, the nearby repeater processes the header to determine if it should relay the packet, deliver it to an attached device, or discard it. ... The packet with then be relayed from repeater to repeater through the backbone (in a store-and-forward fashion using the procedure described above) until it arrives at the final repeater which broadcasts it directly to the user's packet radio." Kahn page 1477. "For the following discussion, we refer to the operation of n experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48 bit preamble followed by a variable length header (typically 96-144 bits), followed by the text and a 32 bit checksum." Kahn page 1478. "Each radio has an identifier which we shall call its selector. The selectors play a central rile in the network routing and control procedures." Kahn page 1479. Figure 8, Kahn page 1479. Figure 9, Kahn page 1480. Figure 12, Kahn page 1489.
a controller configured to be in communication with the transceiver, the controller configured to provide preformatted messages for communication;	Figure 6, Kahn page 1478. "An individual packet radio is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the

	antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation. The digital section contains a microprocessor controller plus semiconductor memory for packet buffering and software. The radio and digital sections area connected by a high speed interface (see Fig. 6)." Kahn page 1477.
wherein the preformatted message comprises at least one packet, wherein the packet comprises: a receiver address comprising a scalable address of the at least one of the intended receiving transceivers; sender address comprising the unique address of the sending transceiver; a command indicator comprising a command code; at least one data value comprising a scalable message; and an error detector comprising a redundancy check error detector; and wherein the controller is configured to interact with the transceiver to send preformatted command messages.	"For the following discussion, we refer to the operation of n experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48 bit preamble followed by a variable length header (typically 96-144 bits), followed by the text and a 32 bit checksum." Kahn page 1478. "Each radio has an identifier which we shall call its selector. The selectors play a central rile in the network routing and control procedures." Kahn page 1479. Figure 8, Kahn page 1479. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET,

	discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number,

	and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the

	monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses:

	"In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g.,

	information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some

	information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43.

	In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
20. The communication device of claim 19, further comprising a sensor operatively configured to detect a condition and output a sensed data signal that corresponds to the condition to the transceiver.	The above contentions for claim 19 are hereby incorporated by reference. "1) TIU measurement software-provides sources and sinks of

	controlled traffic streams; generates and collects pickup packets; received, collects end-device CUMSTATS; and periodically sends collected data to station measurement process. … 2) PRU measurement software-collects subnet CUMSTATS and snapshots; enters local data into pickup packets; and periodically sends collected data to station measurement process. PRU CUMSTATS include counters for packets transmitted, packets received, packets in error, and retransmission histograms. 3) Station measurement software- controls experiments and collects the resulting measurement data." Kahn page 1495.
21. The communication device of claim 20, wherein the transceiver is configured to receive a preformatted command message requesting sensed data, confirms the receiver address is its own unique address, receives the sensed data signal, formats the sensed data signal into scalable byte segments, determines a number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet.	The above contentions for claim 20 are hereby incorporated by reference. "1) TIU measurement software-provides sources and sinks of controlled traffic streams; generates and collects pickup packets; received, collects end-device CUMSTATS; and periodically sends collected data to station measurement process. … 2) PRU measurement software-collects subnet CUMSTATS and snapshots; enters local data into pickup packets; and periodically sends collected data to station measurement process. PRU CUMSTATS include counters for packets transmitted, packets received, packets in error, and retransmission histograms. 3) Station measurement software- controls experiments and collects the resulting measurement data." Kahn page 1495. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional

	references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets:

	U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43.

	‘252 patent, Figure 31. “For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module’s assigned tier address for that network service module to be addressed.” ‘252, 42:18-39. “FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and “network message” field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the

	nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields.

	Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
25. A wireless communication device for use in a communication system to communicate a number of commands and sensed data between remote wireless communication devices, the wireless communication device comprising:	"Packet radio (PR) is a technology that extends the application of packet switching which evolved for networks of point-to-point communication lines to the domain of broadcast radio. It offers a highly efficient way of using a multiple access radio channel with a potentially large number of mobile subscribers to support computer communication and to provide local distribution of information over a wide geographic area." Kahn Abstract.
a transceiver configured to send and receive wireless communications; and	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of this packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet. Upon correct receipt of the packet, the nearby repeater processes the header to determine if it should relay the packet, deliver it to an attached device, or discard it. ... The packet with then be relayed from repeater to repeater through the backbone (in a store-and-forward fashion using the procedure

	described above) until it arrives at the final repeater which broadcasts it directly to the user's packet radio." Kahn page 1477. "For the following discussion, we refer to the operation of n experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48 bit preamble followed by a variable length header (typically 96-144 bits), followed by the text and a 32 bit checksum." Kahn page 1478. "Each radio has an identifier which we shall call its selector. The selectors play a central rile in the network routing and control procedures." Kahn page 1479. Figure 8, Kahn page 1479. Figure 9, Kahn page 1480. Figure 12, Kahn page 1489.
a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to reformat a message comprising receiver address comprising a scalable address of at least one remote wireless device; a command indicator comprising a command code; a data value comprising a scalable message.	Figure 6, Kahn page 1478. "An individual packet radio is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation. The digital section contains a microprocessor controller plus semiconductor memory for packet buffering and software. The radio and digital sections area connected by a high speed interface (see Fig. 6)." Kahn page 1477.

	"For the following discussion, we refer to the operation of n experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48 bit preamble followed by a variable length header (typically 96-144 bits), followed by the text and a 32 bit checksum." Kahn page 1478. "Each radio has an identifier which we shall call its selector. The selectors play a central rile in the network routing and control procedures." Kahn page 1479. Figure 8, Kahn page 1479. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter

	memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Similarly, Burchfiel, which is also directed to the PRNET,

	discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command

	station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2.

	U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first,

	broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a

	network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing

	explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 7,468,661 based on KAHN

The '661 Patent – Claim	Kahn, "*Advances in Packet Radio Technology*", Proceedings of the IEEE, Vol. 66, No. 11, November 1978.
1. A system for remote data collection, assembly, storage, and event detection and reporting, comprising:	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of interconnection for the (potentially mobile) community of users." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a

Exhibit P1 – Invalidity Chart for U.S. Patent No. 7,468,661 based on KAHN

with a wide area network (WAN);	cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
a plurality of transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users. These backbone radios, known as repeaters, receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. This extends the range of the system beyond line of sight." Kahn, p. 1477. "For military operation, where a separate backbone network might be infeasible to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to "double up" as a repeater, to support network traffic. In this case; we do not identify a separate backbone repeater network per se, since it would be indistinguishable from the network of user packet radios." Kahn, p. 1477. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481. "The initial ARPA program objective was to develop a geographically

	distributed network consisting of an array of packet radios managed by one or more mini-computer based "stations," and to experimentally evaluate the performance of the system." Kahn, p. 1488. "Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487 "While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a

Exhibit P1 – Invalidity Chart for U.S. Patent No. 7,468,661 based on KAHN

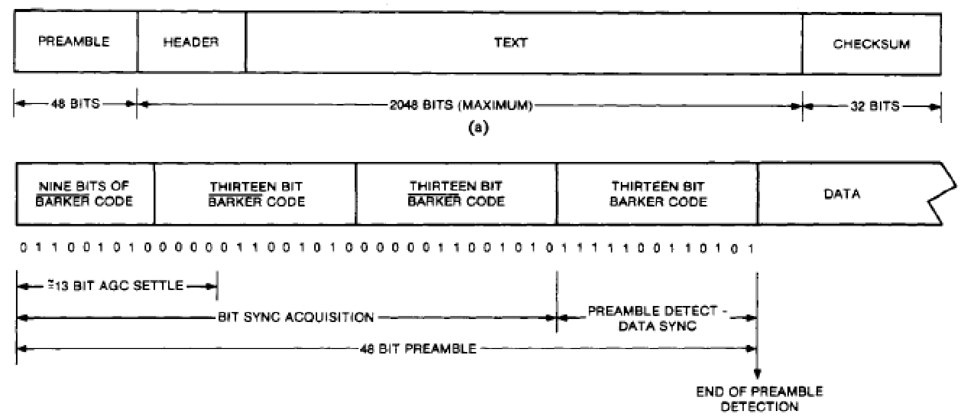
	measurement file located at the station." Kahn, p. 1495. "At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.  (b) **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.** Kahn page 1479
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN.	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.

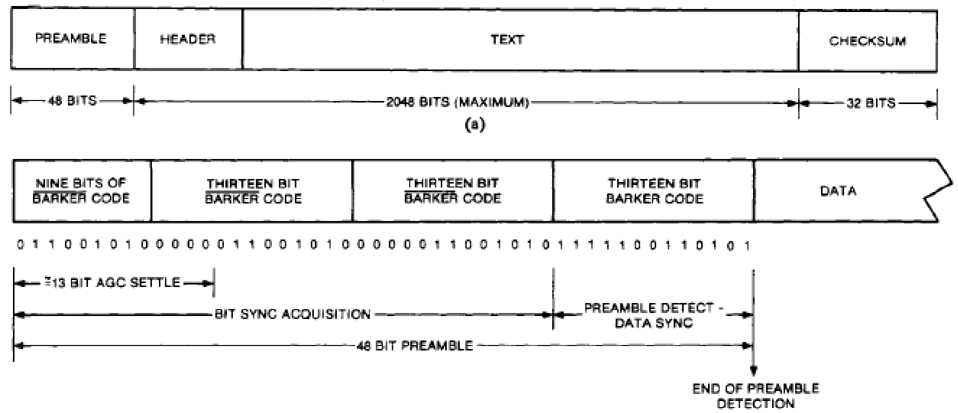
Exhibit P1 – Invalidity Chart for U.S. Patent No. 7,468,661 based on KAHN

5. A system for monitoring remote devices, comprising:	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of interconnection for the (potentially mobile) community of users." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
at least one sensor adapted to generate an electrical signal in response to a physical condition;	"Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495.

	"Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495. "At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495. "I) TIU measurement software-provides sources and sinks of controlled traffic streams; generates and collects pickup packets; collects end-device CUMST ATS; and periodically sends collected data to station measurement process. End-device cumstats collected consist of packet activity counters, retransmission histograms, and end-to-end acknowledgment time delay spectra." "2) PRU measurement software-collects subnet CUMSTATS and snapshots; enters local data into pickup packets; and periodically sends collected data to station measurement process. PRU CUMSTATS include counters for packets transmitted, packets received, packets in error, and retransmission histograms." Kahn, p. 1495.
at least one wireless transmitter electrically interfaced with the sensor and configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a radio-frequency (RF) signal;	"The initial ARPA program objective was to develop a geographically distributed network consisting of an array of packet radios managed by one or more mini-computer based "stations," and to experimentally evaluate the performance of the system." Kahn, p. 1488. Figure 13, Kahn page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page

Exhibit P1 – Invalidity Chart for U.S. Patent No. 7,468,661 based on KAHN

	1490. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495.



(b)

Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.

one or more additional wireless transmitters each electrically interfaced with a sensor and configured to receive the RF signal and retransmit the RF signal;	"We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users. These backbone radios, known as repeaters, receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. This extends the range of the system beyond line of sight." Kahn, p. 1477.

	"For military operation, where a separate backbone network might be infeasible to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to "double up" as a repeater, to support network traffic. In this case; we do not identify a separate backbone repeater network per se, since it would be indistinguishable from the network of user packet radios." Kahn, p. 1477.
at least one gateway connected a wide area network (WAN) configured to receive and translate the retransmitted RF signal, the gateway further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN; and	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.
a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.	"The initial ARPA program objective was to develop a geographically distributed network consisting of an array of packet radios managed by one or more mini-computer based "stations," and to experimentally evaluate the performance of the system." Kahn, p. 1488. Figure 13, Kahn page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the

	collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
6. The system of claim 5, wherein the at least one gateway is permanently connected to the WAN.	The above contentions for claim 5 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.
8. The system of claim 5, wherein the gateway translates the encoded electrical signal, the transmitter identification and the transceiver identification information into TCP/IP for communication over the WAN.	The above contentions for claim 5 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.
9. A system for controlling a remote device comprising:	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to

	the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of interconnection for the (potentially mobile) community of users." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
a target remote device having an actuator to be controlled;	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
a computer configured to execute at least one computer program that generates at least one control	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network

signal responsive to a system input signal; said computer integrated with a wide area network (WAN);	station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page

	247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and

	that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

a gateway connected to the WAN configured to receive and translate the at least one control signal	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.
a wireless transmitter coupled with the gateway for transmitting a wireless signal that contains the control signal;	"The initial ARPA program objective was to develop a geographically distributed network consisting of an array of packet radios managed by one or more mini-computer based "stations," and to experimentally evaluate the performance of the system." Kahn, p. 1488. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 7,468,661 based on KAHN

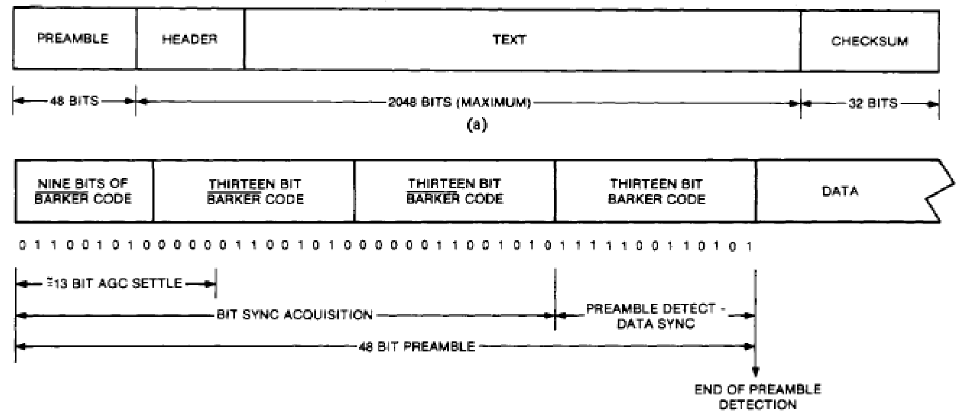
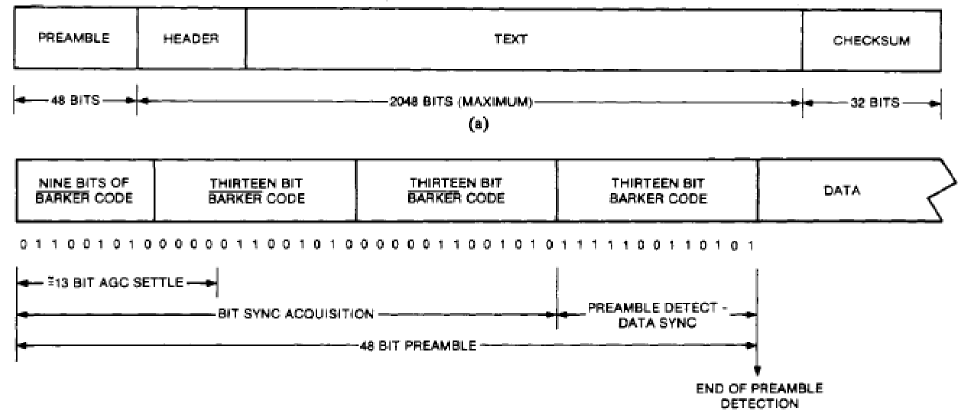
	 (b) **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.**
a first wireless transceiver electrically interfaced with an actuator for receiving the wireless signal and further retransmitting the wireless signal to the target remote device; and	"The initial ARPA program objective was to develop a geographically distributed network consisting of an array of packet radios managed by one or more mini-computer based "stations," and to experimentally evaluate the performance of the system." Kahn, p. 1488. Figure 13, Kahn page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over

Exhibit P1 – Invalidity Chart for U.S. Patent No. 7,468,661 based on KAHN

	the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.  (b) **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.**
logic coupled to the target remote device for extracting the control signal from the retransmitted wireless signal and imparting an action on the actuator in response to the extracted control signal.	"Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent

	No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more

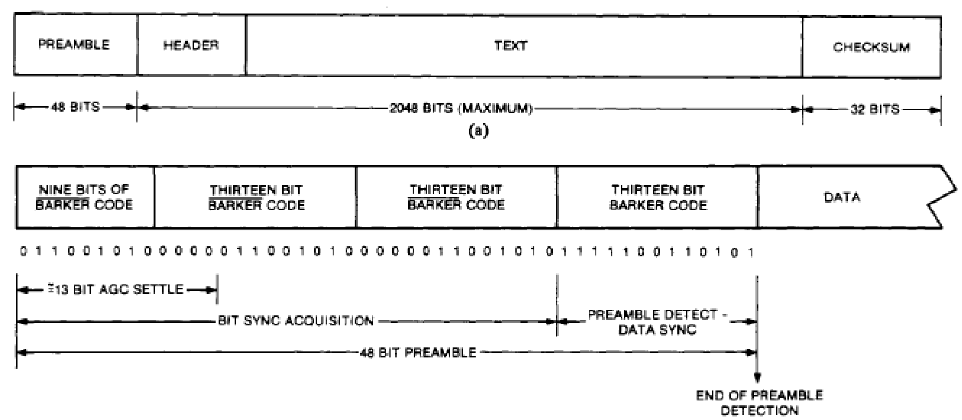
	monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19.

	U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
10. The system of claim 9, further comprising:	The above contentions for claim 9 are hereby incorporated by reference.
a plurality of additional wireless transceivers each coupled to an actuator and configured to receive the wireless signal and to retransmit the wireless signal, wherein one of the plurality of additional wireless transceivers receive the wireless signal from the wireless transmitter and another one of the plurality of the additional wireless transceivers retransmits the wireless signal to the first wireless transceiver.	"E. Point-to-Point Routing In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination." Kahn page 1479. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.

11. The system of claim 9, further comprising:	The above contentions for claim 9 are hereby incorporated by reference.
a plurality of additional wireless transceivers each coupled to an actuator or a sensor and configured to receive the wireless signal and to retransmit the wireless signal, wherein one of the plurality of additional wireless transceivers receive the wireless signal from the wireless transmitter and another one of the plurality of the additional wireless transceivers retransmits the wireless signal to the first wireless transceiver.	"E. Point-to-Point Routing In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination." Kahn page 1479. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
12. A system for remote data collection, assembly, storage, and event detection and reporting, comprising:	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of interconnection for the (potentially mobile) community of users." Kahn page 1469.

	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
a plurality of non-earth orbiting transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the	"We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users. These backbone radios, known as repeaters, receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. This extends the range of the system beyond line of sight." Kahn, p. 1477. "For military operation, where a separate backbone network might be infeasible

predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to "double up" as a repeater, to support network traffic. In this case; we do not identify a separate backbone repeater network per se, since it would be indistinguishable from the network of user packet radios." Kahn, p. 1477. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481. "The initial ARPA program objective was to develop a geographically distributed network consisting of an array of packet radios managed by one or more mini-computer based "stations," and to experimentally evaluate the performance of the system." Kahn, p. 1488. Figure 13, Kahn page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487

	"While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495. "At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.  **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.**

	Kahn page 1493.
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN.	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.
14. The system as defined claim 12, wherein the gateway translates the encoded electrical signal, the transmitter identification, and the transceiver identification information into TCP/IP for communication over the WAN.	The above contentions for claim 12 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.

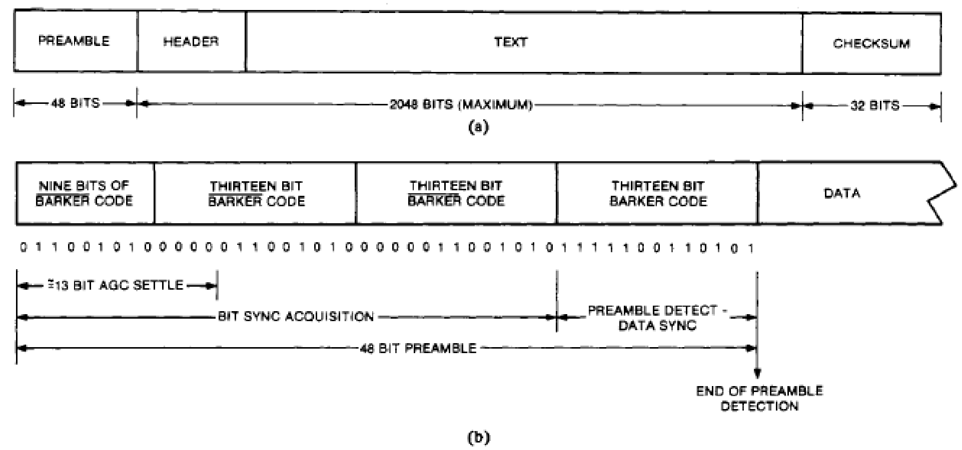
Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Kahn

The '692 Patent – Claim	Kahn, "*Advances in Packet Radio Technology*", Proceedings of the IEEE, Vol. 66, No. 11, November 1978.
1. A system for remote data collection, assembly, and storage comprising:	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of interconnection for the (potentially mobile) community of users." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Kahn

with a wide area network (WAN);	cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
at least one wireless transmitter configured to transmit select information and transmitter identification information;	"In a packet-switched network, the unit of transmission is called a packet. It contains a number of data bits, and is usually of variable length up to a maximum of a few thousand bits. A packet includes all the addressing and control information necessary to correctly route it to its destination." Kahn page 1468. "We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users. These backbone radios, known as repeaters, receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. This extends the range of the system beyond line of sight." Kahn, p. 1477. "For military operation, where a separate backbone network might be infeasible to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to "double up" as a repeater, to support network traffic. In this case; we do not identify a separate backbone repeater network per se, since it would be indistinguishable from the network of user packet radios." Kahn, p. 1477.

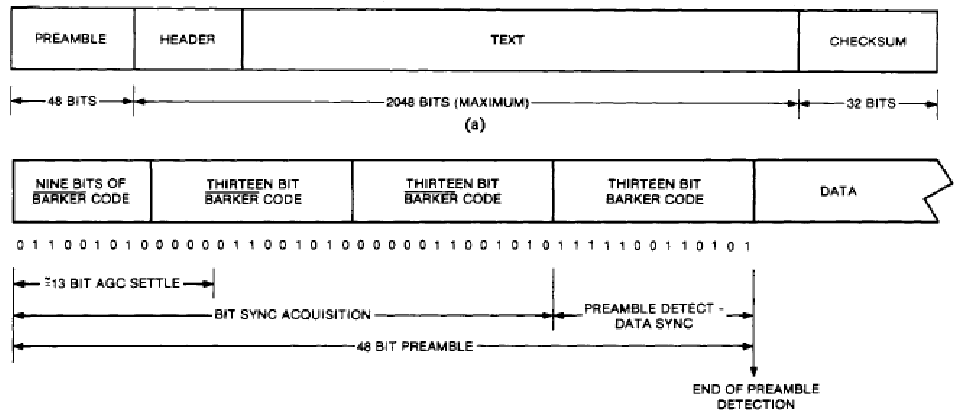
	"Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481. "Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487 "While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495.

	"Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495.  **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.** Kahn page 1479
a plurality of relatively low-power radio-frequency (RF) transceivers dispersed geographically at defined locations configured to receive select information transmitted from at least one nearby wireless transmitter and further configured to transmit the select information, the transmitter identification information and transceiver identification information; and	"We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users. These backbone radios, known as repeaters, receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. This extends the range of the system beyond line of sight." Kahn, p. 1477. "In a packet-switched network, the unit of transmission is called a packet. It contains a number of data bits, and is usually of variable length up to a maximum of a few thousand bits. A packet includes all the addressing and control information necessary to correctly route it to its destination." Kahn

	page 1468. "An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. Figure 6, Kahn page 1478. "For military operation, where a separate backbone network might be infeasible to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to "double up" as a repeater, to support network traffic. In this case; we do not identify a separate backbone repeater network per se, since it would be indistinguishable from the network of user packet radios." Kahn, p. 1477. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481. "The initial ARPA program objective was to develop a geographically distributed network consisting of an array of packet radios managed by one or more mini-computer based "stations," and to experimentally evaluate the performance of the system." Kahn, p. 1488. "Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity in exposition." Kahn, p. 1479.

	"An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487 "While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495. "At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Kahn

	 **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.** Kahn page 1479
at least one gateway connected to the wide area network configured to receive and translate the select information, the transmitter identification information, and transceiver identification information, said gateway further configured to farther transmit the translated information to the computer over the WAN.	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.
3. The system as defined in claim 1, wherein each wireless transmitter is configured to transmit a relatively low-power, radio-frequency (RF) signal.	The above contentions for claim 1 are hereby incorporated by reference. "An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and

	demodulation." Kahn page 1477. Figure 6, Kahn page 1478. Figure 13, Kahn page 1489.
4. The system as defined in claim 1, wherein each wireless transmitter is integrated with a sensor.	The above contentions for claim 1 are hereby incorporated by reference. "1) Network Management and Control: A centralized network management facility (NMF) has been developed for managing and operating the Bay Area experimental testbed. It is somewhat similar to the ARPANET network control center (NCC) [39] in that it collects and displays relevant PRNET status information on a continuous basis. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated." Kahn p[age 1494. "The four primary measurement tools that have been developed are: cumulative statistics (CUMSTATS), snapshots, pickup packets, and neighbor tables, CUMSTATS consist of a variety of activity counters in each node. Snapshots periodically record the disposition of packet buffers and other node resources. Pickup packets are "crates" that start out empty at a traffic source, and pick up information at each node they traverse en route to their destination, thus providing a trace of their history. Neighbor tables are a table of counts of packets received from each "neighbor" PR in range." Kahn page 1495.
5. The system as defined in claim 1, wherein the RF signal transmitted by the receiver contains a concatenation of information comprising select	The above contentions for claim 1 are hereby incorporated by reference. "In a packet-switched network, the unit of transmission is called a packet. It

information and transmitter identification information from the originating transmitter and transceiver identification information for each transceiver that receives and repeats the RF signal.	contains a number of data bits, and is usually of variable length up to a maximum of a few thousand bits. A packet includes all the addressing and control information necessary to correctly route it to its destination." Kahn page 1468. "A packet of some appropriate size is also a natural unit of communication for computers. Processors store, manipulate, and transfer data in finite length segments, as opposed to indefinite length streams. It is therefor natural that these internal segments correspond to the computer generated packets, although a segment could be sent as a sequence of one or more packets." Kahn page 1468. "E. Point-to-Point Routing In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header. Alternatively, the station can send it directly to the digital section of the sender's (or receiver's) packet radio. In this case, each packet originating at that radio could then contain the entire set of selectors in its header. However, this choice may have a significant impact on the network efficiency and ultimately its extendability since the selectors would contribute overhead to the packet and, at most only a small finite set of them could be carried along." Kahn page 1479.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
6. The system as defined in claim 5, wherein the at least one transmitter is replaced by a transceiver, the transceiver further integrated with an actuator.	The above contentions for claim 5 are hereby incorporated by reference. "A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a user may select based on his application." Kahn page 1469. "We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts." Kahn page 1469. "We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users. These backbone radios, known as repeaters, receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. This extends the range of the

	system beyond line of sight." Kahn, p. 1477. "For military operation, where a separate backbone network might be infeasible to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to "double up" as a repeater, to support network traffic. In this case; we do not identify a separate backbone repeater network per se, since it would be indistinguishable from the network of user packet radios." Kahn, p. 1477. "An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. Figure 6, Kahn page 1478. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn page 1495.

7. The system as defined in claim 6, wherein the transceivers are configured to communicate with the gateway via a RF signal.	The above contentions for claim 6 are hereby incorporated by reference. "An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. "The functions of a station are associated with global management of the radio net [24]. Generally speaking, each station is aware of all operational radios in the network. The stations discover the existence of new radios waiting to enter the net and determine when other radios have departed. …One of the requirements for controlling the PRNET is assessing the reliability of radio links between PR's and using the information to assign good routes." Kahn page 1477. Figure 12, Kahn page 1489.
8. The system as defined in claim 7, wherein the computer is further configured to respond to received select information by communicating a control signal to at least one transceiver, wherein the actuator integrated with the transceiver is responsive to the control signal.	The above contentions for claim 7 are hereby incorporated by reference. "A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a user may select based on his application." Kahn page 1469.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Kahn

	"We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn page 1495.
11. The system as defined in claim 1, wherein the gateway includes one selected from the group consisting of:	The above contentions for claim 1 are hereby incorporated by reference.
a modem for establishing a dial-up connection with a remote computer; a network card for communicating across a local area network; a network card for communicating across the WAN, a DSL modem; and an ISDN card to permit backup access to the computer.	"Functions provided within station software installed in 1977 included: network routing control; a gateway to other networks; a network measurement facility which collects, stores, and delivers experimental statistics from any network components; a debugging facility which supports examining and depositing the contents of memory in the PR units; an information service which assists in locating and connecting to people currently using the PRNET; and an experiment configuration control module." Kahn page 1488. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols o access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494.

12. The system as defined in claim 1, wherein the gateway translates the select information, the transmitter identification, and the transceiver identification information to TCP/IP for communication over the WAN.	The above contentions for claim 1 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 Burchfiel discloses: "When some other network is present, it is important to provide connections

	between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. ‘217 patent discloses: “The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module.” ‘217 patent, 46:11-16.

	'650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses:

	"FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
13. The system as defined in claim 1, wherein the WAN is the Internet.	The above contentions for claim 1 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols o access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet

	System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses:

	"The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses:

	"Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
14. The system as defined in claim 1, wherein the WAN is a dedicated Intranet.	The above contentions for claim 1 are hereby incorporated by reference. "At the present time, two packet radio experimental networks are operating: an experimental testbed network covering much of the San Francisco Bay Area; and a local distribution network in the Boston Area, which is used for station software development." Kahn page 1494. "The user's terminal interface unit (TIU) also supports both formed of remote debugging. This feature has proven essential to the Bay Area PRNET development in that station software developers located in Boston and packet radio software developers in Texas can remotely participate in network debugging as the need arises, and new software versions can be conveniently installed from remote development sites as frequently as required." Kahn page 1494.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. …

	2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors

	110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

24. A method for controlling a system comprising:	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of interconnection for the (potentially mobile) community of users." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
remotely collecting data from at least one sensor;	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.

	"“The four primary measurement tools that have been developed are: cumulative statistics (CUMSTATS), snapshots, pickup packets, and neighbor tables, CUMSTATS consist of a variety of activity counters in each node. Snapshots periodically record the disposition of packet buffers and other node resources. Pickup packets are "crates" that start out empty at a traffic source, and pick up information at each node they traverse en route to their destination, thus providing a trace of their history. Neighbor tables are a table of counts of packets received from each "neighbor" PR in range." Kahn page 1495.
processing the data into a radio-frequency (RF) signal;	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477.
transmitting the RF signal, via a relatively low-power transceiver, to a gateway;	"The functions of a station are associated with global management of the radio net [24]. Generally speaking, each station is aware of all operational radios in the network. The stations discover the existence of new radios waiting to enter the net and determine when other radios have departed. …One of the requirements for controlling the PRNET is assessing the reliability of radio links between PR's and using the information to assign good routes." Kahn page 1477. Figure 12, Kahn page 1489.
translating the data in the RF signal into a network transfer protocol;	The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Kahn

	internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494.
sending the translated data to a computer, wherein the computer is configured to appropriately respond to the data generated by the at least one sensor by generating an appropriate control signal;	"The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET." Kahn page 1494.
sending the control signal via the network to the gateway,	The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494.
translating the control signal from a network transfer protocol into an RF control signal;	"By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494.
transmitting the RF control signal;	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
receiving the RF control signal;	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
translating the received RF control signal into an analog signal; and	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477.

applying the analog signal to an actuator to effect the desired system response.	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
25. The method of claim 24, wherein the RF signal contains a concatenation of information comprising encoded data information and transmitter identification information from an originating transmitter.	The above contentions for claim 24 are hereby incorporated by reference. "In a packet-switched network, the unit of transmission is called a packet. It contains a number of data bits, and is usually of variable length up to a maximum of a few thousand bits. A packet includes all the addressing and control information necessary to correctly route it to its destination." Kahn page 1468. "A packet of some appropriate size is also a natural unit of communication for computers. Processors store, manipulate, and transfer data in finite length segments, as opposed to indefinite length streams. It is therefor natural that these internal segments correspond to the computer generated packets, although a segment could be sent as a sequence of one or more packets." Kahn page 1468. "E. Point-to-Point Routing In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this

	case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header. Alternatively, the station can send it directly to the digital section of the sender's (or receiver's) packet radio. In this case, each packet originating at that radio could then contain the entire set of selectors in its header. However, this choice may have a significant impact on the network efficiency and ultimately its extendability since the selectors would contribute overhead to the packet and, at most only a small finite set of them could be carried along." Kahn page 1479. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
26. The method of claim 25, wherein the step of transmitting the RF signal is further performed by at least one transceiver, wherein the transceiver is configured to concatenate a transceiver identification code to the RF signal.	The above contentions for claim 25 are hereby incorporated by reference. "Regardless of how the routing entries are finally created within the repeaters along the point-to-point route, it may still be desirable to carry along within each data packet the selector for the next downstream repeater, or even the next few repeaters. The latter strategy may have significant operational as well as performance advantages as is discussed further in Section V." Kahn page 1479.
27. The method of claim 25, wherein the step of	The above contentions for claim 25 are hereby incorporated by reference.

transmitting the RF control signal is further performed by at least one transceiver, wherein the transceiver is configured to receive and transmit the RF control signal.	"“E. Point-to-Point Routing In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header. Alternatively, the station can send it directly to the digital section of the sender's (or receiver's) packet radio. In this case, each packet originating at that radio could then contain the entire set of selectors in its header. However, this choice may have a significant impact on the network efficiency and ultimately its extendability since the selectors would contribute overhead to the packet and, at most only a small finite set of them could be carried along." Kahn page 1479." Figure 9, Kahn page 1480. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.

28. The method of claim 25, wherein the steps of translating and applying the received RF control signal are performed only by an identified transceiver electrically integrated with an actuator.	The above contentions for claim 25 are hereby incorporated by reference. "The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station." Kahn page 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
29. The method of claim 25, wherein the network is the Internet.	The above contentions for claim 1 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols o access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses:

	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway

	function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44.

	"For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
30. The method of claim 25, wherein the network is an Intranet.	The above contentions for claim 1 are hereby incorporated by reference. "At the present time, two packet radio experimental networks are operating: an experimental testbed network covering much of the San Francisco Bay Area; and a local distribution network in the Boston Area, which is used for station software development." Kahn page 1494. "The user's terminal interface unit (TIU) also supports both formed of remote

	debugging. This feature has proven essential to the Bay Area PRNET development in that station software developers located in Boston and packet radio software developers in Texas can remotely participate in network debugging as the need arises, and new software versions can be conveniently installed from remote development sites as frequently as required." Kahn page 1494.
31. The method of claim 25, wherein the network transfer protocol is TCP/IP.	The above contentions for claim 25 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard

	internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses:

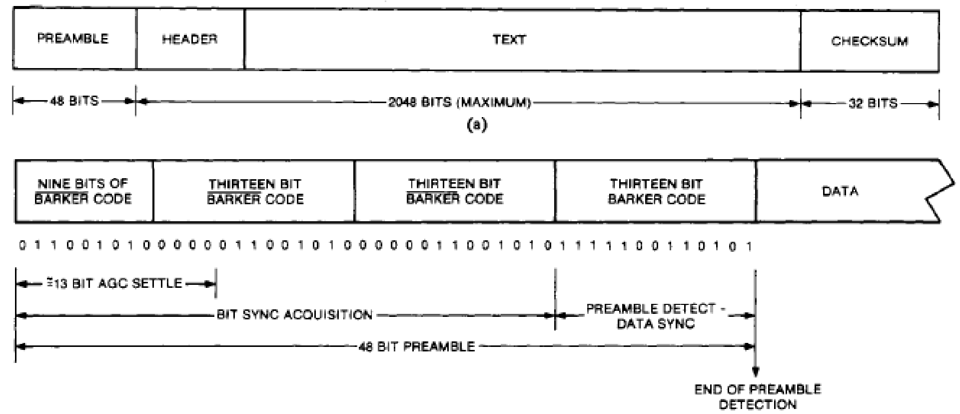
	"The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all

	Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
32. A system for monitoring remote devices comprising:	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of

	interconnection for the (potentially mobile) community of users." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
at least one sensor adapted to generate an electrical signal in response to a physical condition;	"1) Network Management and Control: A centralized network management facility (NMF) has been developed for managing and operating the Bay Area experimental testbed. It is somewhat similar to the ARPANET network control center (NCC) [39] in that it collects and displays relevant PRNET status information on a continuous basis. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated." Kahn p[age 1494. "The four primary measurement tools that have been developed are: cumulative statistics (CUMSTATS), snapshots, pickup packets, and neighbor tables, CUMSTATS consist of a variety of activity counters in each node. Snapshots periodically record the disposition of packet buffers and other node resources. Pickup packets are "crates" that start out empty at a traffic source, and pick up information at each node they traverse en route to their destination, thus providing a trace of their history. Neighbor tables are a table of counts of packets received from each "neighbor" PR in range." Kahn page 1495.
at least one wireless transmitter configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a	"In a packet-switched network, the unit of transmission is called a packet. It contains a number of data bits, and is usually of variable length up to a maximum of a few thousand bits. A packet includes all the addressing and control information necessary to correctly route it to its destination." Kahn

low-power radio-frequency (RF) signal;	page 1468. “We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users. These backbone radios, known as repeaters, receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. This extends the range of the system beyond line of sight.” Kahn, p. 1477. “For military operation, where a separate backbone network might be infeasible to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to "double up" as a repeater, to support network traffic. In this case; we do not identify a separate backbone repeater network per se, since it would be indistinguishable from the network of user packet radios.” Kahn, p. 1477. “An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital sections which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation.” Kahn page 1477. Figure 6, Kahn page 1478. “Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range.” Kahn, p. 1481. “Each radio has an identifier which we shall call its selector.” Kahn, p. 1479. “For the purposes of this paper, we assume the selectors are unique for clarity

	in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487 "While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495.

	 (b) **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.** Kahn page 1479
at least one gateway connected a wide area network (WAN) configured to receive and translate the RF signal, the gateway further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN; and	"The functions of a station are associated with global management of the radio net [24]." Kahn page 1477. "Functions provided within station software installed in 1977 included: network routing control; a gateway to other networks; a network measurement facility which collects, stores, and delivers experimental statistics from any network components; a debugging facility which supports examining and depositing the contents of memory in the PR units; an information service which assists in locating and connecting to people currently using the PRNET; and an experiment configuration control module." Kahn page 1488. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to

	access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.
a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
34. The system defined in claim 32, wherein each wireless transmitter is configured to transmit a relatively low-power radio-frequency (RF) signal.	The above contentions for claim 32 are hereby incorporated by reference. "An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital sections which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. Figure 6, Kahn page 1478.

36. The system defined in claim 32, wherein the gateway translates the encoded electrical signal, the transmitter identification, and the transceiver identification information into TCP/IP for communicating over the WAN.	The above contentions for claim 32 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page

	22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP)

	signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2.

	The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
37. The system defined in claim 32, wherein the WAN in the Internet.	The above contentions for claim 32 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.

	Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical

	to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located

	anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
38. The system defined in claim 32, wherein the WAN is a dedicated Intranet.	The above contentions for claim 32 are hereby incorporated by reference. "At the present time, two packet radio experimental networks are operating: an experimental testbed network covering much of the San Francisco Bay Area; and a local distribution network in the Boston Area, which is used for station software development." Kahn page 1494. "The user's terminal interface unit (TIU) also supports both formed of remote debugging. This feature has proven essential to the Bay Area PRNET development in that station software developers located in Boston and packet

	radio software developers in Texas can remotely participate in network debugging as the need arises, and new software versions can be conveniently installed from remote development sites as frequently as required." Kahn page 1494.
42. A system for controlling remote devices comprising:	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of interconnection for the (potentially mobile) community of users." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
a computer configured to execute at least one computer program that generates at least one control	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network

signal responsive to a system input signal; said computer integrated with a wide area network (WAN);	station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
at least one gateway connected to the WAN configured to receive and translate the at least one control signal; said gateway further configured to transmit a radio-frequency (RF) signal containing the control signal and destination information;	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
at least one wireless low-power RF transceiver configured to receive the RF signal from the gateway; said wireless transceiver configured to translate the RF signal to an analog output signal, the wireless transceiver electrically coupled with an actuator; and	"In a packet-switched network, the unit of transmission is called a packet. It contains a number of data bits, and is usually of variable length up to a maximum of a few thousand bits. A packet includes all the addressing and control information necessary to correctly route it to its destination." Kahn page 1468. "We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users. These backbone radios, known as repeaters,

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Kahn

	receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. This extends the range of the system beyond line of sight." Kahn, p. 1477. "For military operation, where a separate backbone network might be infeasible to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to "double up" as a repeater, to support network traffic. In this case; we do not identify a separate backbone repeater network per se, since it would be indistinguishable from the network of user packet radios." Kahn, p. 1477. "An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital sections which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. Figure 6, Kahn page 1478. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481. "Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487

	"While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495.

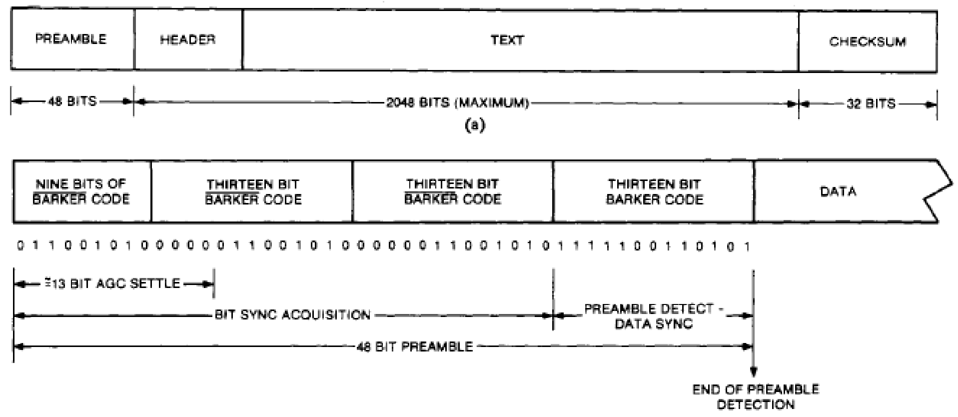
	 **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.** Kahn page 1479 "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.
an actuator configured to receive the analog output signal from the wireless transceiver, the actuator further configured to translate the analog output signal into a response.	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Kahn

43. The system defined in claim 42, the system input signal comprising:	The above contentions for claim 42 are hereby incorporated by reference.
a concatenation of information including data from a sensor, transceiver identification information from the originating transceiver, and transceiver identification information for each transceiver that receives and repeats the RF signal.	"In a packet-switched network, the unit of transmission is called a packet. It contains a number of data bits, and is usually of variable length up to a maximum of a few thousand bits. A packet includes all the addressing and control information necessary to correctly route it to its destination." Kahn page 1468. "A packet of some appropriate size is also a natural unit of communication for computers. Processors store, manipulate, and transfer data in finite length segments, as opposed to indefinite length streams. It is therefor natural that these internal segments correspond to the computer generated packets, although a segment could be sent as a sequence of one or more packets." Kahn page 1468. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input into the digital section of his packet radio, which ads some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet." Kahn page 1477. "E. Point-to-Point Routing In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the

point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header. Alternatively, the station can send it directly to the digital section of the sender's (or receiver's) packet radio. In this case, each packet originating at that radio could then contain the entire set of selectors in its header. However, this choice may have a significant impact on the network efficiency and ultimately its extendability since the selectors would contribute overhead to the packet and, at most only a small finite set of them could be carried along." Kahn page 1479.

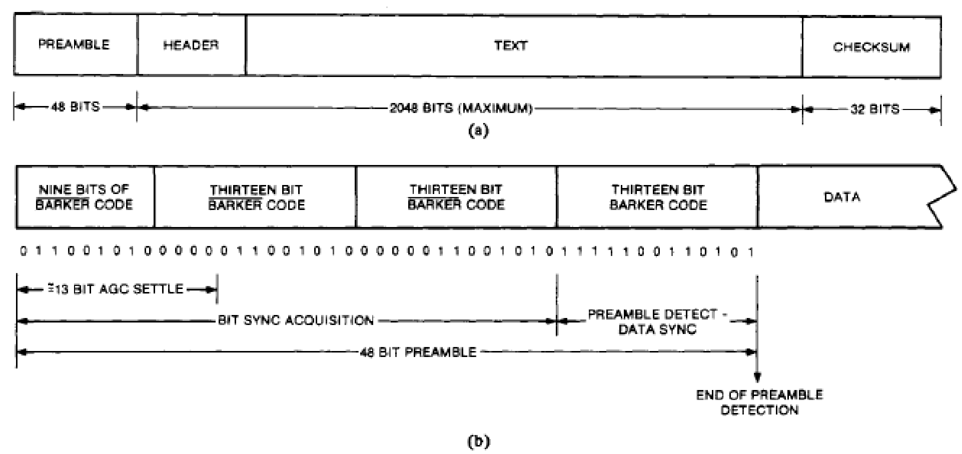


Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.

Kahn page 1479.

To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of

	one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
46. The system defined in claim 42, wherein the gateway translates the RF signal and the RF control signal into TC/IP for communication over the WAN.	The above contentions for claim 42 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet

	System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses:

	"The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses:

	"Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
47. The system defined in claim 42, wherein the WAN is the Internet.	The above contentions for claim 42 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of

	one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249.

	Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to

	implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
48. The system defined in claim 42, wherein the WAN is a dedicated Intranet.	The above contentions for claim 42 are hereby incorporated by reference. "At the present time, two packet radio experimental networks are operating: an

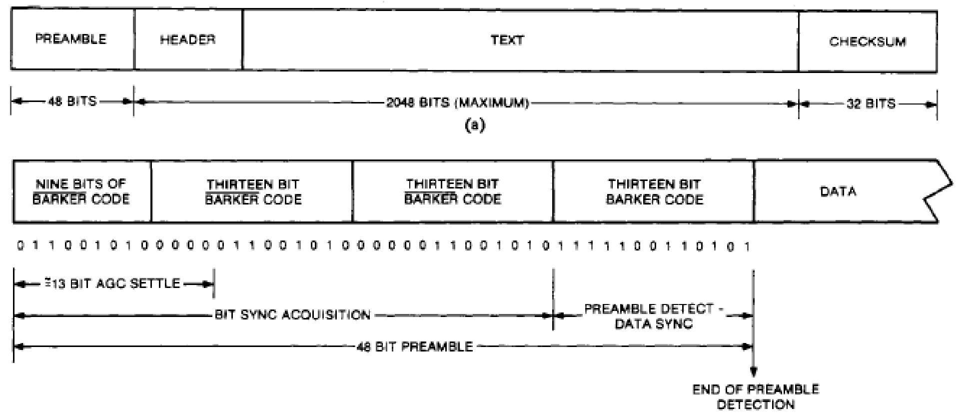
	experimental testbed network covering much of the San Francisco Bay Area; and a local distribution network in the Boston Area, which is used for station software development." Kahn page 1494. "The user's terminal interface unit (TIU) also supports both formed of remote debugging. This feature has proven essential to the Bay Area PRNET development in that station software developers located in Boston and packet radio software developers in Texas can remotely participate in network debugging as the need arises, and new software versions can be conveniently installed from remote development sites as frequently as required." Kahn page 1494.
49. A system for managing an arrangement of application specific remote devices comprising:	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of interconnection for the (potentially mobile) community of users." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network

	can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
a computer configured to execute a multiplicity of computer programs, each computer program executed to generate at least one control signal in response to at least one application system input, said computer integrated with a wide area network (WAN);	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
at least one gateway connected to the WAN configured as a two-way communication device to receive and translate the at least one control signal and the at least one application system input; said gateway further configured to translate and transmit a radio-frequency (RF) signal containing the control signal and destination information, said gateway further configured to receive and translate the at least one application system input and source information;	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.

at least one wireless relatively low-power RF transceiver per computer program configured to receive the RF signal from the gateway; said wireless transceiver configured to translate the RF signal to an analog output signal, the wireless transceiver electrically coupled with an actuator and a sensor;	"In a packet-switched network, the unit of transmission is called a packet. It contains a number of data bits, and is usually of variable length up to a maximum of a few thousand bits. A packet includes all the addressing and control information necessary to correctly route it to its destination." Kahn page 1468. "We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users. These backbone radios, known as repeaters, receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. This extends the range of the system beyond line of sight." Kahn, p. 1477. "For military operation, where a separate backbone network might be infeasible to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to "double up" as a repeater, to support network traffic. In this case; we do not identify a separate backbone repeater network per se, since it would be indistinguishable from the network of user packet radios." Kahn, p. 1477. "An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital sections which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. Figure 6, Kahn page 1478. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481.

	"Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487 "While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Kahn

	 (b) **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.** Kahn page 1479 “The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging.” Kahn, p. 1494.
an actuator configured to receive the analog output signal from the wireless transceiver, the actuator further configured to translate the analog output signal into a response; and	“From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis.” Kahn, p. 1495.

a sensor configured to translate a physical condition into an analog version of the application system input.	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
51. The system as defined in claim 49, wherein the at least one gateway translates the RF signal and the RF control signal into TCP/IP for communication over the WAN.	The above contentions for claim 49 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses:

	"Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.

	‘217 patent discloses: “The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module.” ‘217 patent, 46:11-16. ‘650 patent discloses “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art.” ‘650 patent, 6:11-26. “Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers.” ‘650 patent, 8:42-44. “For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112.” ‘650 patent, 10:54-57.

	'773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
52. The system as defined in claim 49, wherein the WAN in the Internet.	The above contentions for claim 49 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host

	protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116.

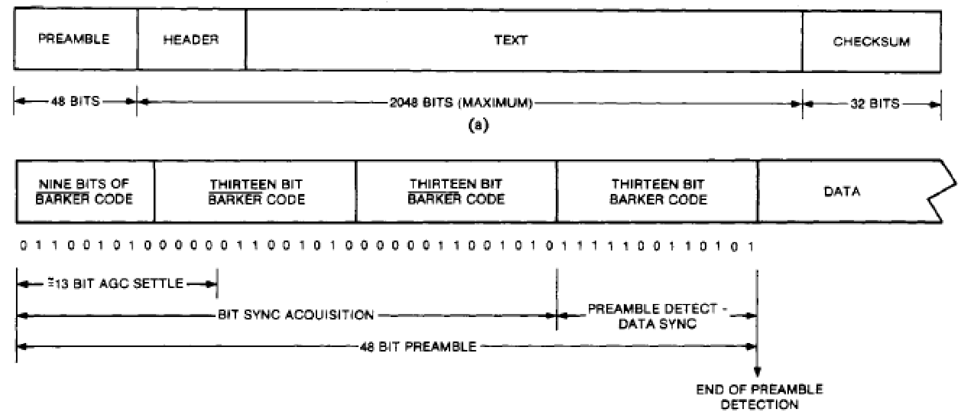
	Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
53. The system as defined in claim 49, wherein the	The above contentions for claim 49 are hereby incorporated by reference.

WAN is a dedicated Intranet.	"At the present time, two packet radio experimental networks are operating: an experimental testbed network covering much of the San Francisco Bay Area; and a local distribution network in the Boston Area, which is used for station software development." Kahn page 1494. "The user's terminal interface unit (TIU) also supports both formed of remote debugging. This feature has proven essential to the Bay Area PRNET development in that station software developers located in Boston and packet radio software developers in Texas can remotely participate in network debugging as the need arises, and new software versions can be conveniently installed from remote development sites as frequently as required." Kahn page 1494.
54. The system as defined in claim 49, wherein the at least one gateway is connected to the WAN by a network selected from the group consisting of a telecommunications network, private radio-frequency network, and a computer network.	The above contentions for claim 49 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.
55. A method of collecting information and providing data services comprising:	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly

	into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of interconnection for the (potentially mobile) community of users." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
adaptively configuring a data translator at the output of a local controller, wherein the data translator converts the output data stream into an information signal consisting of a transmitter code and an information field;	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital sections which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. Figure 6, Kahn page 1478. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481.

	"Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487 "While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Kahn

	 **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.** Kahn page 1479
adaptively configuring at least one transmitter with the data translator, wherein the transmitter converts the information signal into a low-power RF signal;	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital sections which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. Figure 6, Kahn page 1478. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481. "Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity

	in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487 "While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Kahn

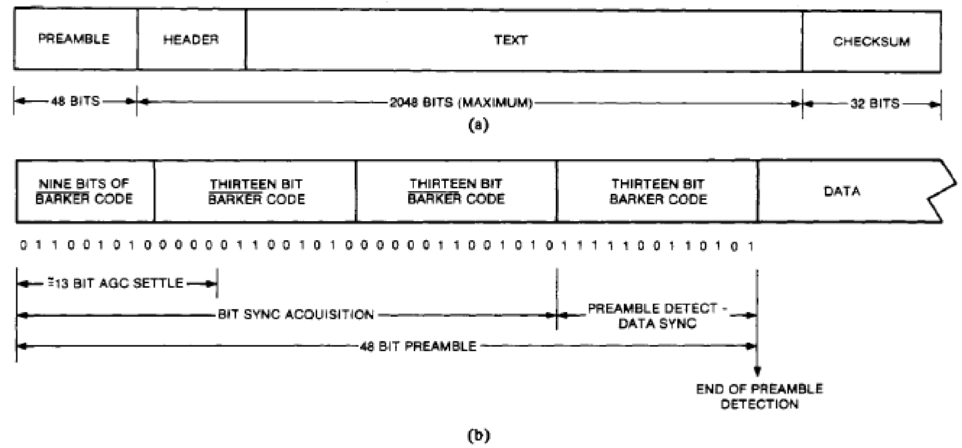
<table>
<tr>
<td></td>
<td>


Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.

Kahn page 1479
</td>
</tr>
<tr>
<td>placing a plurality of relatively low-power radio-frequency (RF) transceivers dispersed geographically wherein the low power RF signal is received and repeated as required to communicate the information signal to a gateway, the gateway providing access to a WAN;</td>
<td>"We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users. These backbone radios, known as repeaters, receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. This extends the range of the system beyond line of sight." Kahn, p. 1477.

"For military operation, where a separate backbone network might be infeasible to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to "double up" as a repeater, to support network traffic. In this case; we do not identify a separate backbone repeater network per se, since it would be indistinguishable from the network of user packet radios." Kahn, p. 1477.

"An individual packet radio unit is a small piece of electronic equipment which</td>
</tr>
</table>

	consists of a radio section and a digital sections which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. Figure 6, Kahn page 1478. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481. "Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487 "While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Measurement facilities have been built into the PR and station software. They

provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495.

"Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495.

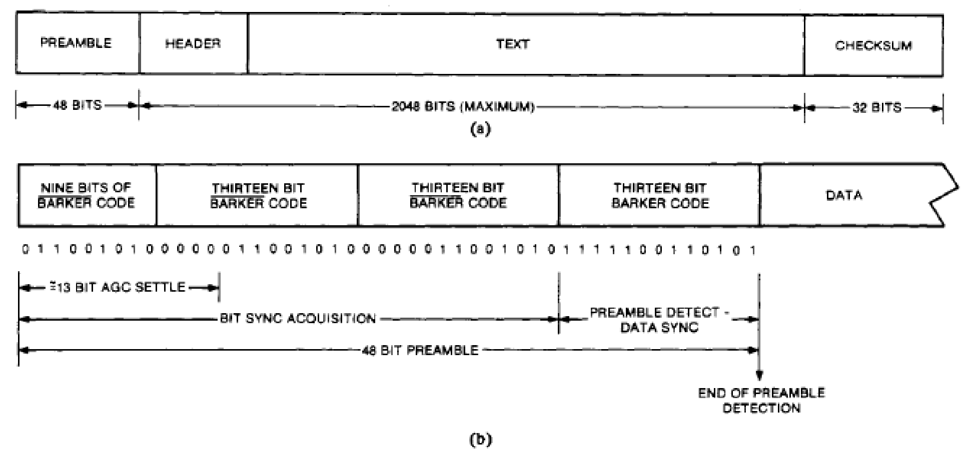


Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.

Kahn page 1479

"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to

	access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
translating the low-power RF signal within the gateway to a WAN compatible data transfer protocol;	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
transferring the translated low-power RF signal via the WAN to a computer wherein the computer is configured to manipulate and store data provided in	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station

said signal; and	can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495.
granting client access to the computer.	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.
56. The method of claim 55 wherein the WAN is the Internet.	The above contentions for claim 55 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed

	explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249.

	Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable

	hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station

	can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.
57. The method of claim 55 wherein the WAN is an Intranet.	The above contentions for claim 55 are hereby incorporated by reference. "At the present time, two packet radio experimental networks are operating: an experimental testbed network covering much of the San Francisco Bay Area; and a local distribution network in the Boston Area, which is used for station software development." Kahn page 1494. "The user's terminal interface unit (TIU) also supports both formed of remote debugging. This feature has proven essential to the Bay Area PRNET development in that station software developers located in Boston and packet radio software developers in Texas can remotely participate in network debugging as the need arises, and new software versions can be conveniently installed from remote development sites as frequently as required." Kahn page 1494.
59. The method of claim 55 wherein the clients access the information using a web browser.	The above contentions for claim 55 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports

	both forms of remote debugging." Kahn, p. 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the

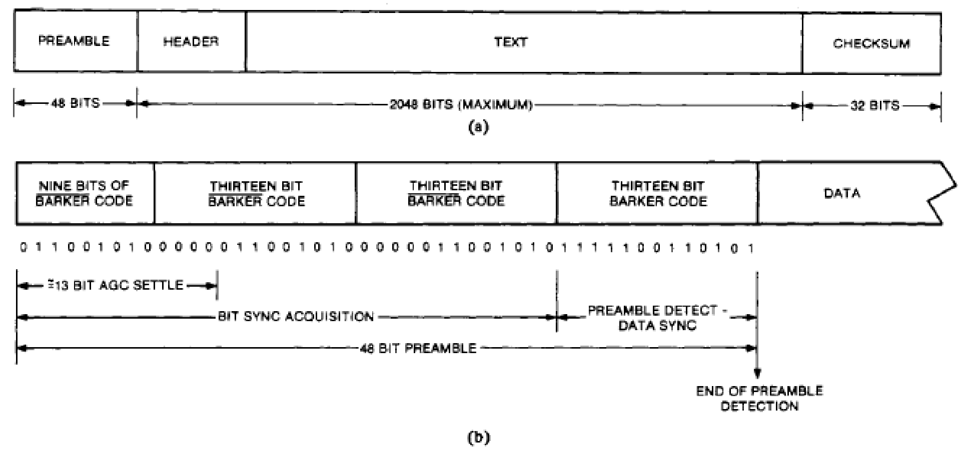
	destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks.…" Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As

	shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

60. A method for controlling an existing control system with a local controller comprising:	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of interconnection for the (potentially mobile) community of users." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
adaptively configuring a data translator disposed between and in communication with both a local controller and a wireless transceiver, wherein the data translator is configured to translate the local controller data stream into an information signal consisting of a transceiver identification code and a	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital sections which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477.

concatenation of function codes, the data translator further configured to translate control signals from the wireless transceiver into local controller recognized control signals;	Figure 6, Kahn page 1478. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481. "Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487 "While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Kahn

	"Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495.  **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.** Kahn page 1479 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.

remotely collecting data from the at least one relatively low-powered radio-frequency (RF) transceiver integrated with the data translator;	A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of interconnection for the (potentially mobile) community of users." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495.

	"Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495.
processing the data into an RF signal;	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital sections which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. Figure 6, Kahn page 1478. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481. "Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487 "While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a

	microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490.
transmitting the RF signal to a gateway;	"The functions of a station are associated with global management of the radio net [24]. Generally speaking, each station is aware of all operational radios in the network." Kahn page 1477. Figure 13, page 1489. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
translating the data in the RF signal into a network transfer protocol;	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.
sending the translated data to a computer, wherein the computer is configured to appropriately respond to the data generated by at least one sensor by generating an appropriate control signal;	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a

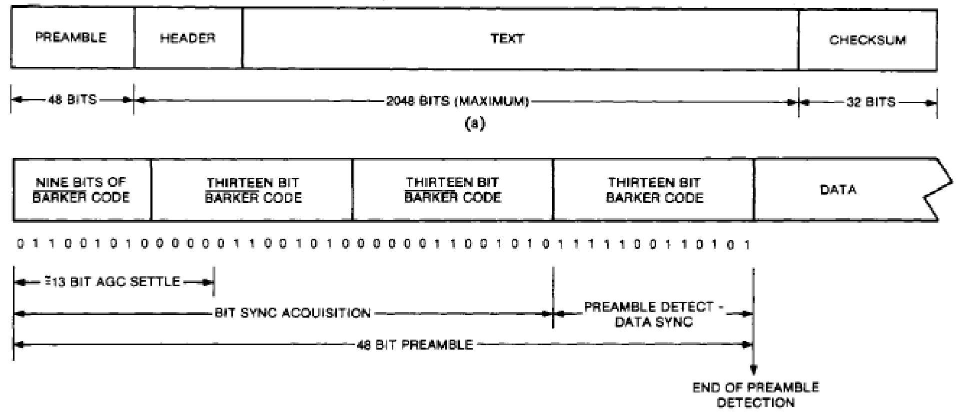
	cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
sending the control signal via the network to the gateway;	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
translating the control signal from a network transfer protocol into an RF control signal;	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
transmitting the RF control signal;	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over

	the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
receiving the RF control signal;	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
translating the received RF control signal into a local controller recognized control signal; and	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
applying the local controller recognized control signal via a local control to effect the desired system response.	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
61. The method of claim 60, wherein the step of transmitting the RF control signal is further performed by at least one transceiver, wherein the transceiver is configured to receive and transmit the RF control signal.	The above contentions for claim 60 are hereby incorporated by reference. "We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users. These backbone radios, known as repeaters, receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. This extends the range of the

	system beyond line of sight." Kahn, p. 1477. "For military operation, where a separate backbone network might be infeasible to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to "double up" as a repeater, to support network traffic. In this case; we do not identify a separate backbone repeater network per se, since it would be indistinguishable from the network of user packet radios." Kahn, p. 1477. "An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital sections which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. Figure 6, Kahn page 1478. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481. "Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487 "While in the receive mode, each radio would use its own unique identifier to

	generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Kahn



(b)

Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.

Kahn page 1479

"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494.

"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.

62. The method of claim 60, wherein the network is the Internet.	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22

	"When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

	‘650 patent discloses “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art.” ‘650 patent, 6:11-26. “Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers.” ‘650 patent, 8:42-44. “For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112.” ‘650 patent, 10:54-57. ‘773 patent discloses: “Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." ‘773 patent, 7:39-43. ‘773 patent, Figure 2. The ‘817 patent discloses:

	"FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
63. The method of claim 60, wherein the network is an Intranet.	The above contentions for claim 60 are hereby incorporated by reference. "At the present time, two packet radio experimental networks are operating: an experimental testbed network covering much of the San Francisco Bay Area; and a local distribution network in the Boston Area, which is used for station software development." Kahn page 1494. "The user's terminal interface unit (TIU) also supports both formed of remote debugging. This feature has proven essential to the Bay Area PRNET development in that station software developers located in Boston and packet radio software developers in Texas can remotely participate in network debugging as the need arises, and new software versions can be conveniently installed from remote development sites as frequently as required." Kahn page 1494.
64. The method of claim 60, wherein the network transfer protocol is TCP/IP.	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports

	both forms of remote debugging." Kahn, p. 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the

	destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. ‘217 patent discloses: “The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module.” ‘217 patent, 46:11-16. ‘650 patent discloses “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As

	shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

Exhibit P1– Invalidity Chart for U.S. Patent No. 8,013,732 based on Kahn

The '732 Patent – Claim	Kahn, "*Advances in Packet Radio Technology*", Proceedings of the IEEE, Vol. 66, No. 11, November 1978.
1. A system for remote data collection, assembly, storage, event detection and reporting and control, comprising:	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a use may select based on his application. The former category includes such capabilities as network transparency, area coverage/connectivity, mobile operation, internetting, coexistence, throughput with low delay, and rapid deployment. The last category includes error control options, routing options, and services for various tactical applications. … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. The Packet radio network merely provides a high throughput, low delay means of interconnection for the (potentially mobile) community of users." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated	"The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a

with a wide area network (WAN);	cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging." Kahn, p. 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22

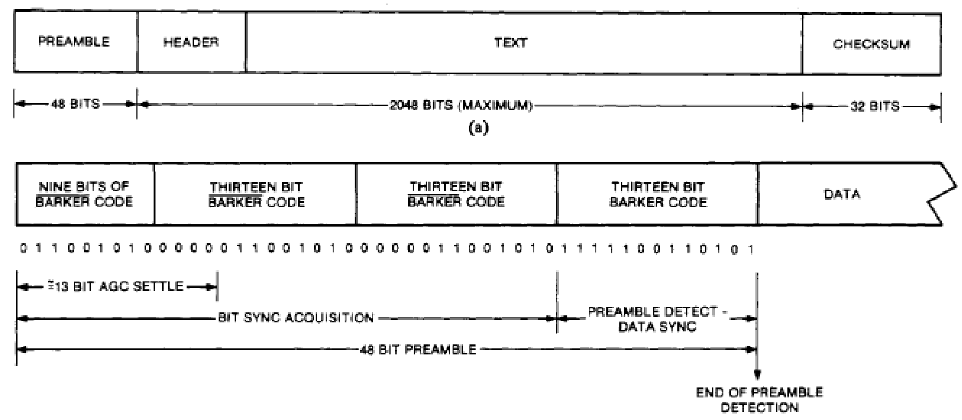
	Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred

	across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2.

	The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
a plurality of transceivers dispersed geographically at defined locations, each transceiver electrically inter- faced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission;	"We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users. These backbone radios, known as repeaters, receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. This extends the range of the system beyond line of sight." Kahn, p. 1477. "For military operation, where a separate backbone network might be infeasible to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to "double up" as a repeater, to support network traffic. In this case; we do not identify a separate backbone repeater network per se, since it would be indistinguishable from the network of user packet radios." Kahn, p. 1477. "Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, p. 1481. "The initial ARPA program objective was to develop a geographically distributed network consisting of an array of packet radios managed by one or more mini-computer based "stations," and to experimentally evaluate the performance of the system." Kahn, p. 1488.

	"Each radio has an identifier which we shall call its selector." Kahn, p. 1479. "For the purposes of this paper, we assume the selectors are unique for clarity in exposition." Kahn, p. 1479. "An important potential use of such a mechanism is to use the unique identifier of the next intended receiver as one input, thus generating a waveform which is associated with a particular slot and a particular receiver." Kahn, p. 1487 "While in the receive mode, each radio would use its own unique identifier to generate the reference pattern for its receiver." Kahn, p. 1487. Figure 13, page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes)." Kahn page 1490. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, p. 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, p. 1495. "At the conclusion of a measurement run, the data can be automatically spooled

Exhibit P1– Invalidity Chart for U.S. Patent No. 8,013,732 based on Kahn

	over the ARPANET to a remote site (e.g., UCLA) for analysis.” Kahn, p. 1495.  **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.** Kahn page 1479
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmit- ting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN and wherein at least one of said plurality of transceivers is also electrically interfaced with an actuator to control an actuated device.	“The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2] . The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET. The user's terminal interface unit (TIU) also supports both forms of remote debugging.” Kahn, p. 1494. “From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the

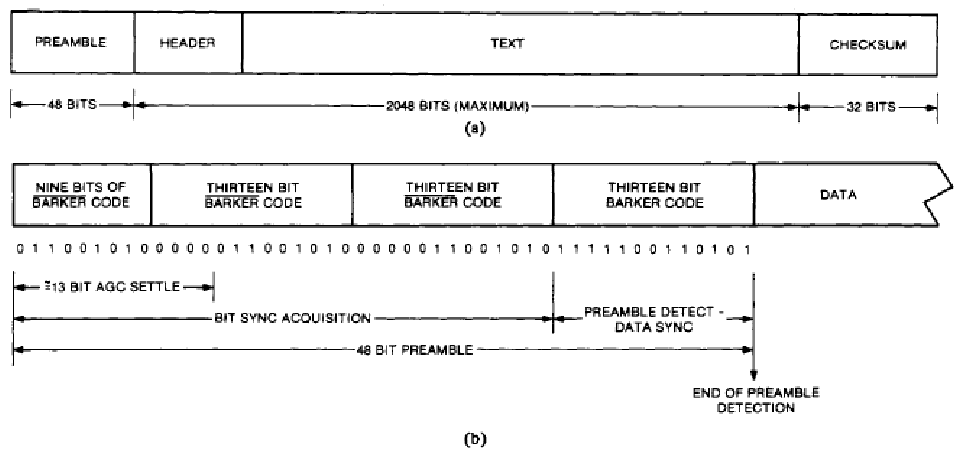
	conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging

	functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses:

	"The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
13. In a system comprising a plurality of wireless devices configured for remote wireless communication and comprising a device for monitoring and controlling remote devices, the	"Packet radio (PR) is a technology that extends the application of packet switching which evolved for networks of point-to-point communication lines to the domain of broadcast radio. It offers a highly efficient way of using a multiple access radio channel with a potentially large number of mobile

device comprising:	subscribers to support computer communication and to provide local distribution of information of very a wide geographic area." Kahn page 1468. "A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs, or write and execute programs to run on remote hosts." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn, p. 1495.
a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from another wireless transceiver in a predetermined signal type;	"We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users." Kahn page 1477. "Store-and-Forward Operation An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation. The digital section contains a microprocessor controller plus semiconductor memory for packet buffering and software. The radio and digital sections are connected by a high speed interface (see Fig. 6)." Kahn page 1477.

Exhibit P1– Invalidity Chart for U.S. Patent No. 8,013,732 based on Kahn

	"Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of his packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet." Kahn page 1477. "For the following discussion, we refer to the operation of an experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48 bit preamble followed by a variable length header (typically 96-144 bits), followed by the text and a 32 bit checksum." Kahn page 1478.  **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.** Figure 8, Kahn page 1479. "Each radio has an identifier which we shall call its selector. The selectors play a central role in the network routing and control procedures. … E. Point-to-Point Routing

	In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station sent the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header. Alternatively, the station can send it directly to the digital section of the sender's (or receiver's) packet radio. In this case, each packet originating at that radio could then contain the entire set of selectors in its header. However, this choice may have a significant impact on the network efficiency and ultimately its extendability since the selectors would contribute overhead to the packet, and, at most, only a small finite set of them could be carried along." Kahn page 1479. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while and experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site. Operating software in the PRU's, TIU's and station performs collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station. From that station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn page 1495.
the transceiver being further configured to wirelessly retransmit in the predetermined signal	"We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication

type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	network service to the users. These backbone radios, known as repeaters, receive packets from nearby users and relay them. The repeaters also accept packets from other nearby repeaters for relaying. … For military operation, where a separate backbone network might be infeasible to deploy, each user's radio might be equipped to support not only his own traffic but that of other designated users. That is, the user's radio may also have to double up" as a repeater, to support network traffic." Kahn page 1477. "Store-and-Forward Operation An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation. The digital section contains a microprocessor controller plus semiconductor memory for packet buffering and software. The radio and digital sections are connected by a high speed interface (see Fig. 6)." Kahn page 1477. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of his packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet." Kahn page 1477. "Each radio has an identifier which we shall call its selector. The selectors play a central role in the network routing and control procedures. … E. Point-to-Point Routing In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an

Exhibit P1– Invalidity Chart for U.S. Patent No. 8,013,732 based on Kahn

	ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station sent the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header. Alternatively, the station can send it directly to the digital section of the sender's (or receiver's) packet radio. In this case, each packet originating at that radio could then contain the entire set of selectors in its header. However, this choice may have a significant impact on the network efficiency and ultimately its extendability since the selectors would contribute overhead to the packet, and, at most, only a small finite set of them could be carried along." Kahn page 1479.
a data controller operatively coupled to the transceiver and the sensor, the data controller configured to control the transceiver and receive data from the sensor, the data controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation. The digital section contains a microprocessor controller plus semiconductor memory for packet buffering and software. … For each transmitted packet, the digital unit selects the transmit frequency (normally fixed), data rate, power, and time of transmission. In addition, it performs the packet processing to route the packet through the network. " Kahn page 1477.
14. The device of claim 13, wherein the data controller is configured to receive data packets comprising control signals and in response to the control signals provide a control signal to an actuator for implementation of a command.	The above contentions for claim 13 are hereby incorporated by reference. "*1) Network Management and Control:* A centralized network management facility (NMF) has been developed for managing and operating the Bay Area testbed. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and

	faults can be detected, diagnosed, and isolated. *2) Debugging the Network:* All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses:

	"The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred

	embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

16. The device of claim 13**,** wherein the data controller is configured to receive data packets comprising a function code, and in response to the function code, implement a function.	The above contentions for claim 13 are hereby incorporated by reference. "*1) Network Management and Control:* A centralized network management facility (NMF) has been developed for managing and operating the Bay Area testbed. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated. *2) Debugging the Network:* All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless

	commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count,

	data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
17. The device of claim 13**,** wherein the data controller is configured to format data packets for transmission via the transceiver, the data packets comprising a function code corresponding to sensed data and the unique identification code	The above contentions for claim 13 are hereby incorporated by reference. "*1) Network Management and Control:* A centralized network management facility (NMF) has been developed for managing and operating the Bay Area testbed. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated. *2) Debugging the Network:* All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No.

	6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60.

	"During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses:

	"In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
18. The device of claim 13, further comprising a memory to store one or more function codes corresponding to the device, the function codes corresponding to a number of functions the data controller can implement.	The above contentions for claim 13 are hereby incorporated by reference. "*1) Network Management and Control:* A centralized network management facility (NMF) has been developed for managing and operating the Bay Area testbed. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated. *2) Debugging the Network:* All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1494.

Exhibit P1– Invalidity Chart for U.S. Patent No. 8,013,732 based on Kahn

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when

	some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type

	Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
19. The device of claim 13, further comprising an actuator configured to receive command data from the controller and in response implement the command.	The above contentions for claim 13 are hereby incorporated by reference. "*1) Network Management and Control:* A centralized network management facility (NMF) has been developed for managing and operating the Bay Area testbed. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and

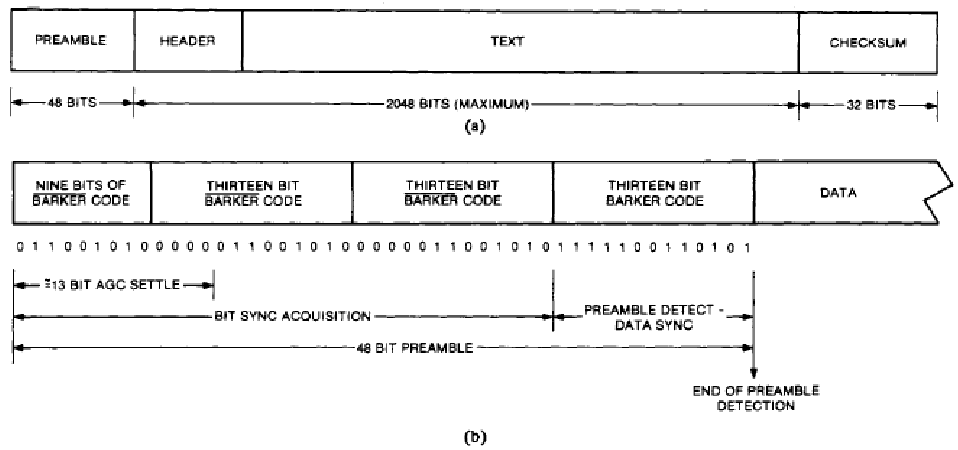
	faults can be detected, diagnosed, and isolated. *2) Debugging the Network:* All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses:

	"The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred

	embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

31. A wireless communication system including wireless communication devices capable of wireless communication, the wireless communication system comprising:	"Packet radio (PR) is a technology that extends the application of packet switching which evolved for networks of point-to-point communication lines to the domain of broadcast radio. It offers a highly efficient way of using a multiple access radio channel with a potentially large number of mobile subscribers to support computer communication and to provide local distribution of information of very a wide geographic area." Kahn page 1468. "A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs, or write and execute programs to run on remote hosts." Kahn page 1469.
at least one wireless communication device comprising a transceiver, the transceiver having a unique identification code and being interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from another wireless transceiver in a predetermined signal type;	"We assume that a set of radios distributed throughout a geographic area, which we call the backbone, provides a carrier-like packet communication network service to the users." Kahn page 1477. "Store-and-Forward Operation An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation. The digital section contains a microprocessor controller plus semiconductor memory for packet buffering and software. The radio and digital sections are connected by a high speed interface (see Fig. 6)." Kahn page 1477. "Normal store-and-forward operation within the network takes place as

Exhibit P1– Invalidity Chart for U.S. Patent No. 8,013,732 based on Kahn

	follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of his packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet." Kahn page 1477. "For the following discussion, we refer to the operation of an experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48 bit preamble followed by a variable length header (typically 96-144 bits), followed by the text and a 32 bit checksum." Kahn page 1478.  **Fig. 8. Structure of a transmitted packet. (a) EPR packet format. (b) EPR packet preamble detail.** Figure 8, Kahn page 1479. "Each radio has an identifier which we shall call its selector. The selectors play a central role in the network routing and control procedures. … E. Point-to-Point Routing In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it

	reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station sent the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header. Alternatively, the station can send it directly to the digital section of the sender's (or receiver's) packet radio. In this case, each packet originating at that radio could then contain the entire set of selectors in its header. However, this choice may have a significant impact on the network efficiency and ultimately its extendability since the selectors would contribute overhead to the packet, and, at most, only a small finite set of them could be carried along." Kahn page 1479. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while and experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site. Operating software in the PRU's, TIU's and station performs collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station. From that station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn page 1495.
a controller operatively coupled to the transceiver and the sensor, the controller configured to control transceiver operations and receive data from the sensor, the controller configured to format data	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation. The digital section

packets for transmission via the transceiver with at least some data packets comprising data representative of data sensed with the sensor; and	contains a microprocessor controller plus semiconductor memory for packet buffering and software. … For each transmitted packet, the digital unit selects the transmit frequency (normally fixed), data rate, power, and time of transmission. In addition, it performs the packet processing to route the packet through the network. " Kahn page 1477.
wherein the controller is configured to receive control signals from a data packet and based on the control signals send instructions to an actuator to implement a command.	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). … We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs, or write and execute programs to run on remote hosts." Kahn page 1469. "*1) Network Management and Control:* A centralized network management facility (NMF) has been developed for managing and operating the Bay Area testbed. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated. *2) Debugging the Network:* All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1494. "From that station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn page 1495.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when

	some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type

Exhibit P1– Invalidity Chart for U.S. Patent No. 8,013,732 based on Kahn

	Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
32. The wireless communication system of claim 31**,** further comprising at least one gateway connected to a WAN configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more	The above contentions for claim 31 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross internetwork debugger known as X-NET. By using internet protocols to access

retransmitting transceivers, said gateway further configured to further transmit the translated information to a computing device over the WAN.	the station's X-RAY process, even the radios can be remotely debugged from the ARPANET." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the

	destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. ‘217 patent discloses: “The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module.” ‘217 patent, 46:11-16. ‘650 patent discloses “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As

	shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

33. The wireless communication system of claim 31, further comprising a computing device configured to receive user input and based on user input, the computing device formatting control signals, and wherein the controller is configured to receive the control signals via wireless transmission and take action based on the control signals.	The above contentions for claim 31 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET." Kahn page 1494. "*1) Network Management and Control:* A centralized network management facility (NMF) has been developed for managing and operating the Bay Area testbed. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated. *2) Debugging the Network:* All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No.

	6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60.

	"During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses:

	"In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
34. The wireless communication system of claim 31, wherein the controller is configured to provide one or more function codes in the data packet in response to data sensed by the sensor.	The above contentions for claim 31 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET." Kahn page 1494. "*1) Network Management and Control:* A centralized network management facility (NMF) has been developed for managing and operating the Bay Area testbed. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and

	faults can be detected, diagnosed, and isolated. *2) Debugging the Network:* All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control

	process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user

	application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

35. The wireless communication system of claim 31, wherein the controller comprises a memory containing a plurality of function codes specific to the sensor.	The above contentions for claim 31 are hereby incorporated by reference. "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the ARPANET." Kahn page 1494. "*1) Network Management and Control:* A centralized network management facility (NMF) has been developed for managing and operating the Bay Area testbed. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated. *2) Debugging the Network:* All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No.

	6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60.

	"During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses:

	"In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 8,754,780 based on Kahn

The '780 Patent – Claim	Kahn, "*Advances in Packet Radio Technology*", Proceedings of the IEEE, Vol. 66, No. 11, November 1978.
1. In a system comprising a plurality of wireless devices, a device comprising:	"Packet radio (PR) is a technology that extends the application of packet switching which evolved for networks of point-to-point communication lines to the domain of broadcast radio. It offers a highly efficient way of using a multiple access radio channel with a potentially large number of mobile subscribers to support computer communication and to provide local distribution of information over a wide geographic area." Kahn Abstract.
a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from a second wireless transceiver in a predetermined signal type;	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. The radio section contains the antenna, RF transmitter/receiver, and all signal processing and data detection logic associated with modulation and demodulation." Kahn page 1477. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of this packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet. Upon correct receipt of the packet, the nearby repeater processes the header to determine if it should relay the packet, deliver it to an attached device, or discard it. ... The packet with then be relayed from repeater to repeater through the backbone (in a store-and-forward fashion using the procedure described above) until it arrives at the final repeater which broadcasts it directly to the user's packet radio." Kahn page 1477.

	"Each radio has an identifier which we shall call its selector. The selectors play a central rile in the network routing and control procedures." Kahn page 1479 Figure 9, Kahn page 1480 Figure 12, Kahn page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn page 1490.
the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the second wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn page 1490. "In this case, each packet originating at that radio could then contain the entire set of selectors in its header." Kahn page 1479.
a controller operatively coupled to the transceiver and the sensor, the controller configured to control the transceiver and receive data from the sensor, the controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.	"An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. … The digital section contains a microprocessor controller plus semiconductor memory for packet buffering and software. … For each transmitted packet, the digital unit selects the transmit frequency (normally fixed), data rate,

	power, and time of transmission. In addition, it performs the packet processing to route the packet through the network." Kahn page 1477. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn page 1490. "One of the requirements for controlling the PRNET is assessing the reliability of radio links between PR's and using the information to assign good routes. A primary source of link information is the PR neighbor table whose entries are collected by each radio, summarized, and regularly sent to the station along with other status information." Kahn page 1477. "3) System Monitoring: Once initialized, each packet radio in the network periodically announces its existence by transmitting to the station summary ROP's which contain neighbor tables and other status information. Similarly, terminal devices periodically send summary TOP's (terminal-on packets), which serve much the same function as their counterpart summary ROP's. Both the station and the network monitor make extensive use of summary ROP's and TOP's. The station maintains a connectivity matrix based on information contained in the ROP's for assigning routes. Kahn page 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted,

	if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn page 1495. "2) PRU measurement software-collects subnet CUMSTATS and snapshots; enters local data to station measurement process. PRU CUMSTATS include counters for packets transmitted, packets received, packets in error, and retransmission histograms." Kahn page 1495.
2. The device of claim 1, wherein the controller is configured to receive data packets comprising control signals and in response to the control signals provide a control signal to an actuator for implementation of a command.	The above contentions for claim 1 are hereby incorporated by reference. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn page 1495. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below.

	For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the

	command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that

	causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
4. The device of claim 1, wherein the controller is configured to receive data packets comprising a function code, and in response to the function code, implement a function.	The above contentions for claim 1 are hereby incorporated by reference. "We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data

	bases, manipulate files, run programs or write and execute programs to run on remote hosts. … Many of these operations will be interactive, with a computer response to a remote user entry being desired in real time." Kahn page 1469. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn page 1495. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute

	jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its

	most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters

	and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
5. The device of claim 1, wherein the controller is configured to format data packets for transmission via the transceiver, the data packets comprising a function code corresponding to sensed data and the unique identification code that identifies the transceiver.	The above contentions for claim 1 are hereby incorporated by reference. "An individual packet radio unit is a small piece of electronic equipment which consists of a radio section and a digital section which controls the radio [26]. … The digital section contains a microprocessor controller plus semiconductor memory for packet buffering and software. … For each transmitted packet, the digital unit selects the transmit frequency (normally fixed), data rate, power, and time of transmission. In addition, it performs the packet processing to route the packet through the network." Kahn page 1477. "Each EPR consists of a radio unit, which transmits and receives

	packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn page 1490. "Each radio has an identifier which we shall call its selector. The selectors play a central rile in the network routing and control procedures." Kahn page 1479 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging."

	Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be

	programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater

	functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
6. The device of claim 1, further comprising a memory to store one or more function codes corresponding to the device, the function codes corresponding to a number of functions the controller can implement.	The above contentions for claim 1 are hereby incorporated by reference. "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been

	obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and

	depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command

	or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data,

	functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
7. The device of claim 1, further comprising an actuator configured to receive command data from the controller and in response implement a command.	The above contentions for claim 1 are hereby incorporated by reference. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn page 1495. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the

	monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses:

	"In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
8. The device of claim 1, wherein the second transceiver is nearby to the transceiver.	The above contentions for claim 1 are hereby incorporated by reference. Figure 9 Kahn page 1480. "The location of the major elements of the packet radio tested during 1977 is shown in Fig. 12." Kahn page 1488. Figure 12, Kahn page 1489.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 8.908,842 based on Kahn

The '842 Patent – Claim	Kahn, "*Advances in Packet Radio Technology*", Proceedings of the IEEE, Vol. 66, No. 11, November 1978.
1. A device for communicating information, the device comprising:	"Packet radio (PR) is a technology that extends the application of packet switching which evolved for networks of point-to-point communication lines to the domain of broadcast radio." Kahn Abstract.
a low-power transceiver configured to wirelessly transmit a signal comprising instruction data for delivery to a network of addressable devices;	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a user may select based on his application." Kahn page 1469. "We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. … Many of these operations will be interactive, with a computer response to a remote user entry being desired in real time." Kahn page 1469. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, p. 1490.

	"The EPR design which has been implemented for use in the testbed is functionally described as in Fig. 13 (also see Fig. 6)." Kahn page 1489. Figure 13, Kahn page 1489.
an interface circuit for communicating with a central location; and	"The EPR design which has been implemented for use in the testbed is functionally described as in Fig. 13 (also see Fig. 6)." Kahn page 1489. Figure 13, Kahn page 1489 (e.g., "TERMINAL/STATION INTERFACE" "The interface between the user equipment and the EPR digital unit is the portal through which packets enter and leave the network." Kahn page 1490. "The functions of a station are associated with global management of the radio net [24]. Generally speaking, each station is aware of all operational radios in the network." Kahn page 1477.
a controller coupled to the interface circuit and to the low-power transceiver, the controller configured to establish a communication link between at least one device in the network of addressable devices and the central location using an address included in the signal, the communication link comprising one or more devices in the network of addressable, the controller further configured to receive one or more signals via the low-power transceiver and communicate information contained within the signals to the central location.	"Each radio has an identifier which we shall call its selector." Kahn page 1479. "The EPR design which has been implemented for use in the testbed is functionally described as in Fig. 13 (also see Fig. 6)." Kahn page 1489. Figure 13. (discloses a "microprocessor" coupled to the "terminal/Station interface" and the "radio unit" transceiver.

	Kahn page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, p. 1490. "When a packet is transmitted, the preamble, header and text are read from microprocessor memory under direct memory access (DMA) control. The radio unit completes the packet format previously illustrated in Fig. 8 by adding a 32 bit cyclic redundancy checksum (CRC), then differentially encodes the data, and adds (modulo two) the appropriate PN chip pattern for the selected data rate. .. When not transmitting, the EPR remains in the receive mode. An arriving packet proceeds through RF amplification, down-conversion, IF amplifier and wide-band (noncoherent) automatic gain control (AGC) functions. …The microprocessor executes the appropriate protocol software to determine whether the received packet should be relayed, delivered to an attached user, or station, or discarded." Kahn page 1490.
7. The device of claim 1, wherein the controller is further configured to communicate a transceiver identification code to the central location via the interface circuit.	The above contentions for claim 1 are hereby incorporated by reference. "Each radio has an identifier which we shall call its selector. The selectors play a central role in the network routing and control procedures." Kahn page 1479.

	"In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header." Kahn page 1479.
9. The device of claim 1, wherein transmitted and received signals further comprise a field configured to indicate a destination device for a subsequent transmission path to follow.	The above contentions for claim 1 are hereby incorporated by reference. "In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header." Kahn page 1479.
16. A device for communicating information, the device comprising:	"Packet radio (PR) is a technology that extends the application of packet switching which evolved for networks of point-to-point communication lines to the domain of broadcast radio." Kahn Abstract.
a processor; and	"The EPR design which has been implemented for use in the testbed is functionally described as in Fig. 13…." Fig. 13 discloses a "microprocessor" coupled to the "terminal/Station interface" and the "radio unit" transceiver. Kahn page 1489.
a memory, the memory comprising logical instructions that when executed by the processor are configured to cause the device to:	"When a packet is transmitted, the preamble, header and text are read from microprocessor memory under direct memory access (DMA) control." Kahn page 1490.
wirelessly transmit a signal comprising instruction data for	"Each EPR consists of a radio unit, which transmits and receives

delivery to a network of addressable low-power transceivers;	packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn page 1490. "The radio unit completes the packet format previously illustrated in Fig. 8 by adding a 32 bit cyclic redundancy checksum (CRC), then differentially encodes the data, and add (modulo two) the appropriate PN chip pattern for the selected data rate. The resulting PN modulated stream is then applied to a minimum shift keying (MSK) modulator, and the signal is up-converted to a selected 20MHz portion of the 1710-1850 MHz band, power amplified, and transmitted through an azimuthally omnidirectional antennae." Kahn p. 1490.
establish a communication link between at least one low-power transceiver in the network of addressable low-power transceivers and a central location based on an address included in the signal, the communication link comprising one or more low-power transceivers in the network of addressable low-power transceivers; and	"The packet preamble is used by the radio section of the receiver for several purposes. The first few bits are used to detect the carrier energy and to set the automatic gain control (AGC) to compensate for different signal strengths of the arriving packets. Correct reception of the packet is totally dependent upon acquisition of the preamble. The next few bits are used to acquire bit timing. Following these, the next set of bits is used to acquire packet timing (identify the end of the preamble and the start of the header). Both the header and text are delivered from the radio section to the digital section which knows the header format and can therefore determine the exact start of the text." Kahn page 1478-79. "Each radio has an identifier which we shall call its selector. The selectors play a central role in the network routing and control

	procedures." Kahn page 1479. "In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header. Alternatively, the station can send it directly to the digital section of the sender's (or receiver's) packet radio. In this case, each packet originating at that radio could then contain the entire set of selectors in its header." Kahn page 1479. "Protocols currently implemented are the channel access protocol (CAP), the reliable station to PR protocol (SPP), a statistics gathering feature called CUMSTATS, and a debugging package called X-RAY. CAP is responsible for the primary EPR function of transferring packets to or from the adjacent EPR on a route through the network. CAP is responsible for monitoring the hop-by-hop echo acknowledgment process, retransmission of nonacknowledged packets, invoking alternate routing procedures, and determining packet disposition." Kahn page 1490.
receive one or more low-power RF signals and communicate information contained within the signals to the central location	"In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one

along with a unique transceiver identification number over the communication link.	or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header. Alternatively, the station can send it directly to the digital section of the sender's (or receiver's) packet radio. In this case, each packet originating at that radio could then contain the entire set of selectors in its header." Kahn page 1479. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn page 1490.
17. A device for communicating information, the device comprising:	"Packet radio (PR) is a technology that extends the application of packet switching which evolved for networks of point-to-point communication lines to the domain of broadcast radio." Kahn Abstract.
a low-power transceiver that is configured to wirelessly receive a signal including an instruction data from a remote device;	"A primary objective of a packet radio network is to support real-time interactive communications between computer resources (hosts) connected to the network and user terminals (e.g., terminal-host, host-host, and terminal-terminal interactions). In

	order to satisfy this objective, the network should provide certain basic capabilities and services which can be grouped roughly into two categories: those which are always or automatically provided by the network and those which a user may select based on his application." Kahn page 1469. "We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts. … Many of these operations will be interactive, with a computer response to a remote user entry being desired in real time." Kahn page 1469. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, p. 1490. "The EPR design which has been implemented for use in the testbed is functionally described as in Fig. 13 (also see Fig. 6)." Kahn page 1489. Figure 13, Kahn page 1489.
an interface circuit for communicating with a central location;	"The EPR design which has been implemented for use in the testbed is functionally described as in Fig. 13 (also see Fig. 6)." Kahn page 1489. Figure 13, Kahn page 1489 (e.g., "TERMINAL/STATION

Exhibit P1 – Invalidity Chart for U.S. Patent No. 8.908,842 based on Kahn

	INTERFACE" "The interface between the user equipment and the EPR digital unit is the portal through which packets enter and leave the network." Kahn page 1490. "The functions of a station are associated with global management of the radio net [24]. Generally speaking, each station is aware of all operational radios in the network." Kahn page 1477.
a controller coupled to the interface circuit and to the low-power transceiver, the controller being configured to establish a communication link between the remote device and the central location using address-indicative data included in the signal;	"Each radio has an identifier which we shall call its selector." Kahn page 1479. "The EPR design which has been implemented for use in the testbed is functionally described as in Fig. 13 (also see Fig. 6)." Kahn page 1489. Figure 13. (discloses a "microprocessor" coupled to the "terminal/Station interface" and the "radio unit" transceiver. Kahn page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, p. 1490. "When a packet is transmitted, the preamble, header and text are read from microprocessor memory under direct memory access

	(DMA) control. The radio unit completes the packet format previously illustrated in Fig. 8 by adding a 32 bit cyclic redundancy checksum (CRC), then differentially encodes the data, and adds (modulo two) the appropriate PN chip pattern for the selected data rate. .. When not transmitting, the EPR remains in the receive mode. An arriving packet proceeds through RF amplification, down-conversion, IF amplifier and wide-band (noncoherent) automatic gain control (AGC) functions. …The microprocessor executes the appropriate protocol software to determine whether the received packet should be relayed, delivered to an attached user, or station, or discarded." Kahn page 1490.
the controller further configured to receive one or more data signals from the central location via the interface circuit and communicate information contained within the signals to the remote device.	"Each radio has an identifier which we shall call its selector." Kahn page 1479. "The EPR design which has been implemented for use in the testbed is functionally described as in Fig. 13 (also see Fig. 6)." Kahn page 1489. Figure 13. (discloses a "microprocessor" coupled to the "terminal/Station interface" and the "radio unit" transceiver. Kahn page 1489. "Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, p. 1490.

	"When a packet is transmitted, the preamble, header and text are read from microprocessor memory under direct memory access (DMA) control. The radio unit completes the packet format previously illustrated in Fig. 8 by adding a 32 bit cyclic redundancy checksum (CRC), then differentially encodes the data, and adds (modulo two) the appropriate PN chip pattern for the selected data rate. .. When not transmitting, the EPR remains in the receive mode. An arriving packet proceeds through RF amplification, down-conversion, IF amplifier and wide-band (noncoherent) automatic gain control (AGC) functions. …The microprocessor executes the appropriate protocol software to determine whether the received packet should be relayed, delivered to an attached user, or station, or discarded." Kahn page 1490. "The microprocessor executes the appropriate protocol software to determine whether the received packet should be relayed, delivered to an attached user or station, or discarded." Kahn page 1490. "SPP is an end-to-end protocol which is used for reliable delivery of network monitor and control packets, such as labelling packets sent to an EPR." Kahn page 1490.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Kahn

The '893 Patent – Claim	Kahn, "*Advances in Packet Radio Technology*", Proceedings of the IEEE, Vol. 66, No. 11, November 1978.
1. A system for communicating commands and sensed data between remote devices, the system comprising:	"Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, page 1481 "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, page 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, page 1495. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

a plurality of transceivers, each transceiver being in communication with at least one other of the plurality of transceivers, wherein each transceiver has a unique address, wherein the unique address identities an individual transceiver, wherein each transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with the other transceivers via preformatted messages;	"Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, page 1481 "Each radio has an identifier which we shall call its selector." Kahn, page 1479. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of the packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet." Kahn, page 1477. "Each packet is uniquely identified by a set of bits in its header called the Unique Packet Identification (UPI)." Kahn page 1477. "For the following discussion, we refer to the operation of an experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48-bit preamble followed by a variable length header (typically 96-144 bits) followed by the text and a 32-bit checksum." Kahn, page 1478. Figure 8 Kahn page 1479. "In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is

	first determined by a station, which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and or destination identifier but would not have to carry the entire route in its header." Kahn, page 1479 "Within the PRNET, stations and radios need to communicate control packets reliably. … The Station-PR Protocol (SPP) provides the reliable delivery system." Kahn, page 1481.
a controller, connected to one of the plurality of transceivers, the controller being in communications with each of the plurality of transceivers via a controller transceiver, the controller communicating via preformatted messages;	"Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, page 1490. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of the packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet." Kahn, page 1477.
wherein the preformatted messages comprises at least one packet, wherein the packet comprises:	"For the following discussion, we refer to the operation of an experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48-bit preamble

	followed by a variable length header (typically 96-144 bits) followed by the text and a 32-bit checksum." Kahn, page 1478. Figure 8. Kahn page 1479.
a receiver address comprising a scalable address of the at least one of the intended receiving transceivers;	"In this case, each succeeding packet would only require some form of source and or destination identifier but would not have to carry the entire route in its header." Kahn, page 1479. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). …

	Routing Header: The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Kahn

	supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network

	service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that

	uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
sender address comprising the unique address of the sending transceiver;	"In this case, each succeeding packet would only require some form of source and or destination identifier but would not have to carry the entire route in its header." Kahn, page 1479.
a command indicator comprising a command code;	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional

	references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some

	anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition

	devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Kahn

at least one data value comprising a scalable message; and	"When a packet is to be transmitted, the processor activates a DMA channel to control and monitor the transmission. Under DMA control, the packet is read from the processor memory, convolutionally encoded with a constraint length 24 code, and loaded into a buffer prior to scrambling (bit order permutation). The packet data is read from the buffer bit by bit in pseudorandom order, differentially encoded, and passed to the spread spectrum modulator where each data bit is modulo two added to each chip of the PN chip sequence used to encode that bit. The PN modulated chip sequence is then passed to an MSK modulator, implemented with a SAW device, and having an IF output at 300 MHz. This signal is up-converted to 1780 MHz, amplified to l O W, and fed to the azimuthally omnidirectional antenna. Fig. 15 shows the basic UPR packet and preamble format. In the discussion above, only the header and text bits of the packet are read from the processor memory. The preamble and postamble bits are supplied by the code generator circuitry, and are used in combination by the receiver to determine the receive data rate and coding format of the packet." Kahn, p. 1491. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers,

	which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the

	length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the

	information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet."

	'252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector comprising a redundancy check error detector;	"The EPR radio unit operates with a fixed PN spread spectrum

and	pattern which, for simplicity in implementation, is identical for each transmitted bit. Two transmission data rates are available, 100 and 400 kbits/s, with corresponding spread spectrum patterns of 128 and 32 chips per bit, respectively. The 100-kbits/s rate is used for links with potentially large multipath spreads because the fixed bit length PN chip pattern does not provide the ability to discriminate against intersymbol interference. The radio unit operates in a half duplex mode. When a packet is transmitted, the preamble, header and text are read from microprocessor memory under direct memory access (DMA) control. The radio unit completes the packet format previously illustrated in Fig. 8 by adding a 32 bit cyclic redundancy checksum (CRC), then differentially encodes the data, and adds (modulo two) the appropriate PN chip pattern for the selected data rate. The resulting PN modulated stream is then applied to a minimum shift keying (MSK) modulator, and the signal is up-converted to a selected 20 MHz portion of the 1710-1850 MHz band, power amplified, and transmitted through an azimuthally omnidirectional antenna." Kahn, p. 1490.
wherein the controller sends preformatted command messages via the controller transceiver, and the plurality of transceivers send preformatted response messages.	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, p. 1495.
2. The system of claim 1, wherein the plurality of transceivers further comprise at least one integrated transceiver, wherein the integrated transceiver comprises:	The above contentions for claim 1 are hereby incorporated by reference.
one of the plurality of transceivers; and	"1) Network Monitoring and Control: A centralized network management facility (NMF) has been developed for managing

	and operating the Bay Area experimental testbed. It is somewhat similar to the ARPANET network control center (NCC) [39] in that it collects and displays relevant PRNET status information on a continuous basis. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated. … 3) System Monitoring: Once initialized, each packet radio in the network periodically announces its existence by transmitting to the station summary ROP's which contain neighbor tables and other status information. Similarly, terminal devices periodically send summary TOP (terminal-on packets) , which serve much of the same function as their counterpart summary ROP's." Kahn page 1494.
a sensor detecting a condition and outputting a sensed data signal to the transceiver.	"1) Network Monitoring and Control: A centralized network management facility (NMF) has been developed for managing and operating the Bay Area experimental testbed. It is somewhat similar to the ARPANET network control center (NCC) [39] in that it collects and displays relevant PRNET status information on a continuous basis. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated. … 3) System Monitoring: Once initialized, each packet radio in the network periodically announces its existence by transmitting to the station summary ROP's which contain neighbor tables and other status information. Similarly, terminal devices periodically

	send summary TOP (terminal-on packets) , which serve much of the same function as their counterpart summary ROP's." Kahn page 1494.
3. The system of claim 2, wherein the at least one integrated transceiver receives the preformatted command message requesting sensed data, confirms the receiver address as its own unique address, receives the sensed data signal, formats the sensed data signal into scalable byte segments, determines a number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet, wherein the packets are equal to the number of segments.	The above contentions for claim 2 are hereby incorporated by reference. "We assume that computer resources (hosts) need to be connected with each other and with individual users who might access data bases, manipulate files, run programs or write and execute programs to run on remote hosts….Many of these operations will be interactive, with a computer response to a remote user entry being desired in real-time." Kahn page 1469. "1) Network Monitoring and Control: A centralized network management facility (NMF) has been developed for managing and operating the Bay Area experimental testbed. It is somewhat similar to the ARPANET network control center (NCC) [39] in that it collects and displays relevant PRNET status information on a continuous basis. … From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated. … 3) System Monitoring: Once initialized, each packet radio in the network periodically announces its existence by transmitting to the station summary ROP's which contain neighbor tables and other status information. Similarly, terminal devices periodically send summary TOP (terminal-on packets) , which serve much of the same function as their counterpart summary ROP's." Kahn

	page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed

	throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to

	eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and

	"network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields.

	Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
10. The system of claim 1, wherein the plurality of transceivers further comprise at least one actuated transceiver, wherein the actuated transceiver comprises:	The above contentions for claim 1 are hereby incorporated by reference.
one of the plurality of transceivers;	"2) Debugging the Network: All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the

	ARPANET to a remote site (e.g., UCLA) for analysis." Kahn page 1495.
a sensor detecting a second condition and outputting a sensed data signal to the transceiver; and	"2) Debugging the Network: All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn page 1495.
an actuator controlling a third condition and receiving control signals from the transceiver.	"2) Debugging the Network: All elements of the packet radio network have been designed to be debugged remotely under test as well as operational conditions. The memory of any packet radio's microprocessor can be remotely examined or altered through the use of the X-RAY debugger by a person at the station. The X-RAY process is routinely used to alter operating parameters in the packet radios (such as power output, frequency, timing, and protocol values) and to examine or alter program code." Kahn page 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted,

	if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated. At the conclusion of a measurement run, the data can be automatically spooled over the ARPANET to a remote site (e.g., UCLA) for analysis." Kahn page 1495.
17. A system for communicating commands and sensed data between remote devices, the system comprising:	"Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, page 1481 "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, page 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, page 1495.
a plurality of transceivers, each transceiver being in	"Consider a collection of geographically distributed packet radios,

communication with at least one other of the plurality of transceivers, wherein each transceiver has a unique address, wherein the unique address identities an individual transceiver, wherein each transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with the other transceivers via preformatted messages;	each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, page 1481 "Each radio has an identifier which we shall call its selector." Kahn, page 1479. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of the packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet." Kahn, page 1477. "Each packet is uniquely identified by a set of bits in its header called the Unique Packet Identification (UPI)." Kahn page 1477. "For the following discussion, we refer to the operation of an experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48-bit preamble followed by a variable length header (typically 96-144 bits) followed by the text and a 32-bit checksum." Kahn, p. 1478. Figure 8, Kahn page 1479. "In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station, which is the only element in the net

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Kahn

	that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and or destination identifier but would not have to carry the entire route in its header." Kahn, p. 1479 "Within the PRNET, stations and radios need to communicate control packets reliably. … The Station-PR Protocol (SPP) provides the reliable delivery system." Kahn, p. 1481.
a controller, connected to one of the plurality of transceivers, the controller being in communications with each of the plurality of transceivers via a controller transceiver, the controller communicating via preformatted messages, wherein the preformatted messages comprises at least one packet, wherein the packet comprises:	"Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, page 1490. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of the packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet." Kahn, page 1477.
a receiver address comprising a scalable address of the at least one of the intended receiving transceivers;	"In this case, each succeeding packet would only require some form of source and or destination identifier but would not have to carry the entire route in its header." Kahn, page 1479.

sender address comprising the unique address of the sending transceiver;	"In this case, each succeeding packet would only require some form of source and or destination identifier but would not have to carry the entire route in its header." Kahn, page 1479.
a command indicator comprising a command code;	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute

	jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its

	most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters

	and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
at least one data value comprising a scalable message; and	"When a packet is to be transmitted, the processor activates a DMA channel to control and monitor the transmission. Under DMA control, the packet is read from the processor memory, convolutionally encoded with a constraint length 24 code, and loaded into a buffer prior to scrambling (bit order permutation). The packet data is read from the buffer bit by bit in pseudorandom order, differentially encoded, and passed to the spread spectrum modulator where each data bit is modulo two added to each chip of the PN chip sequence used to encode that bit. The PN modulated chip sequence is then passed to an MSK modulator, implemented with a SAW device, and having an IF output at 300 MHz. This signal is up-converted to 1780 MHz, amplified to l O W, and fed to the azimuthally omnidirectional antenna. Fig. 15 shows the basic UPR packet and preamble format. In the discussion above, only the header and text bits of

	the packet are read from the processor memory. The preamble and postamble bits are supplied by the code generator circuitry, and are used in combination by the receiver to determine the receive data rate and coding format of the packet." Kahn, p. 1491. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields).

	"The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class

	address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message

	format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space.

	Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector comprising a redundancy check error detector;	"The EPR radio unit operates with a fixed PN spread spectrum pattern which, for simplicity in implementation, is identical for each transmitted bit. Two transmission data rates are available, I 00 and 400 kbits/s, with corresponding spread spectrum patterns of 128 and 3 2 chips per bit, respectively. The I 00-kbits/s rate is used for links with potentially large multipath spreads because the fixed bit length PN chip pattern does not provide the ability to discriminate against intersymbol interference. The radio unit operates in a half duplex mode. When a packet is transmitted, the preamble, header and text are read from microprocessor memory under direct memory access (DMA) control. The radio unit completes the packet format previously illustrated in Fig. 8 by adding a 32 bit cyclic redundancy checksum (CRC), then differentially encodes the data, and adds (modulo two) the appropriate PN chip pattern for the selected data rate. The resulting PN modulated stream is then applied to a minimum shift

	keying (MSK) modulator, and the signal is up-converted to a selected 20 MHz portion of the 1710-1850 MHz band, power amplified, and transmitted through an azimuthally omnidirectional antenna." Kahn, p. 1490.
wherein the controller sends preformatted command messages via the controller transceiver, and the plurality of transceivers send preformatted response messages; and	"Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, p. 1490. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of the packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet." Kahn, p. 1477. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, p. 1495.
wherein at least one of the plurality of transceivers further sends preformatted emergency messages.	"Both the station and the network monitor make extensive use of summary ROP's and TOP's. The station maintains a connectivity matrix based on the information contained in the ROP's for assigning routes. Current network connectivity may be displayed at the station upon request, and all state changes for nodes and links may be time stamped and logged. When active, the

	independent network monitoring system also listens to ROP's and maintains a table of the last time that ROP's and TOP's were heard, for each packet radio or terminal interface unit ID. Thus, the exact time of failure of any network element can be obtained-even if a component of the station fails." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation. For example, U.S. Patent No. 5,907,491 discloses that "[w]hile it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28. U.S. Patent No. 6,366,217, discloses that "[t]he information signal contains the data collected by the sensor interface module,

	or the emergency code." '217 patent, 13:66-14:1. U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
18. The system of claim 17, wherein the controller maintains periods of silence by not sending the preformatted command messages during predetermined time periods; and	The above contentions for claim 17 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation. For example, U.S. Patent No. 5,907,491 discloses that "[w]hile it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Kahn

	machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28. U.S. Patent No. 6,366,217, discloses that "[t]he information signal contains the data collected by the sensor interface module, or the emergency code." '217 patent, 13:66-14:1. U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
wherein the at least one of the plurality of transceivers detects a period of silence and sends the preformatted emergency message during the period of silence.	"Both the station and the network monitor make extensive use of summary ROP's and TOP's. The station maintains a connectivity matrix based on the information contained in the ROP's for assigning routes. Current network connectivity may be displayed at the station upon request, and all state changes for nodes and links may be time stamped and logged. When active, the independent network monitoring system also listens to ROP's and maintains a table of the last time that ROP's and TOP's were heard, for each packet radio or terminal interface unit ID. Thus, the exact time of failure of any network element can be obtained-even if a component of the station fails." Kahn page 1494. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation. For example, U.S. Patent No. 5,907,491 discloses that "[w]hile it

	is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28. U.S. Patent No. 6,366,217, discloses that "[t]he information signal contains the data collected by the sensor interface module, or the emergency code." '217 patent, 13:66-14:1. U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
37. A method of communicating between geographically remote devices, the method comprising:	"Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, page 1481

	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. "Measurement facilities have been built into the PR and station software. They provide for the collection and delivery of measurement data over the radio channel in real-time while an experiment is being run; after the experiment has been completed, the data are reduced and analyzed at a remote site." Kahn, page 1495. "Operating software in the PRU's, TIU's, and station performs the collection of measurement data and uses the system protocols for delivery of this data to a measurement file located at the station." Kahn, page 1495.
sending a message;	"Consider a collection of geographically distributed packet radios, each of which is powered on and capable of communicating packets to some subset of radios within line of sight propagation range." Kahn, page 1481 "Each radio has an identifier which we shall call its selector." Kahn, page 1479. "Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of the packet radio, which adds some network routing and control information and passes the packet to the radio

	section for transmission to a nearby repeater which is identified within the packet." Kahn, page 1477.
receiving the message at one or more of the remote devices;	"Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, page 1490. "When not transmitting, the EPR remains in the receive mode. An arriving packet proceeds through RF amplification, down-conversion, IF amplifier and wide-band (noncoherent) automatic gain control (AGC) functions." Kahn page 1490.
processing the message;	"When not transmitting, the EPR remains in the receive mode. An arriving packet proceeds through RF amplification, down-conversion, IF amplifier and wide-band (noncoherent) automatic gain control (AGC) functions." Kahn page 1490.
preparing a response message;	"Many of these operations will be interactive, with a computer response to a remote user entry being desired in real-time." Kahn page 1469. "From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated." Kahn page 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off,

	and data collection may be initiated." Kahn, page 1495. "Both the station and the network monitor make extensive use of summary ROP's and TOP's. The station maintains a connectivity matrix based on the information contained in the ROP's for assigning routes. Current network connectivity may be displayed at the station upon request, and all state changes for nodes and links may be time stamped and logged." Kahn page 1494.
receiving the response message;	"Each EPR consists of a radio unit, which transmits and receives packets, and a microprocessor-based digital unit, which controls the radio and provides packet header processing (e.g., for routing of packets between nodes). An EPR may operate as a repeater, or may be connected to a user's host computer or terminal, or to a station." Kahn, page 1490. "When not transmitting, the EPR remains in the receive mode. An arriving packet proceeds through RF amplification, down-conversion, IF amplifier and wide-band (noncoherent) automatic gain control (AGC) functions." Kahn page 1490.
processing the response message	"When not transmitting, the EPR remains in the receive mode. An arriving packet proceeds through RF amplification, down-conversion, IF amplifier and wide-band (noncoherent) automatic gain control (AGC) functions." Kahn page 1490.
wherein all messages comprise at least one packet, the packet having a predetermined format;	"Normal store-and-forward operation within the network takes place as follows. A user generated packet with associated addressing and control information in the packet header is input to the digital section of the packet radio, which adds some network routing and control information and passes the packet to the radio section for transmission to a nearby repeater which is identified within the packet." Kahn, p. 1477.

	"Each packet is uniquely identified by a set of bits in its header called the Unique Packet Identification (UPI)." Kahn p. 1477. "For the following discussion, we refer to the operation of an experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48-bit preamble followed by a variable length header (typically 96-144 bits) followed by the text and a 32-bit checksum." Kahn, p. 1478. "In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station, which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and or destination identifier but would not have to carry the entire route in its header." Kahn, p. 1479 "Within the PRNET, stations and radios need to communicate control packets reliably. … The Station-PR Protocol (SPP) provides the reliable delivery system." Kahn, p. 1481.
wherein the predetermined format comprises:	
a receiver address comprising a scalable address of the at least one of the intended receiving remote devices;	"Each radio has an identifier which we shall call its selector. The selectors play a central role in the network routing and control procedures. We discuss the point-to-point and broadcast routing

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Kahn

	option below. … E. Point-to-Point Routing In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and/or destination identifier but would not have to carry the entire route in its header." Kahn page 1479.
a sender address comprising an unique address of the sender;	"Each radio has an identifier which we shall call its selector. The selectors play a central role in the network routing and control procedures. We discuss the point-to-point and broadcast routing option below. … E. Point-to-Point Routing In the point-to-point routing procedure, a packet originating at one part of the network proceeds directly through a series of one or more repeaters until it reaches its final destination. The point-to-point route (which consists of an ordered set of selectors) is first determined by a station which is the only element in the net that knows the current overall system connectivity. Having determined a good point-to-point route, where should the station send the point-to-point routing information? One possibility is for it to distribute the information to the individual repeaters along the point-to-point route. In this case, each succeeding packet would only require some form of source and/or destination

	identifier but would not have to carry the entire route in its header." Kahn page 1479.
a command indicator comprising a command code;	"From the NMF, the network can be debugged, the status of the network can be monitored, tests and measurement experiments can be run, and faults can be detected, diagnosed, and isolated." Kahn page 1494. "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the

	monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses:

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Kahn

	"In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a scalable data value comprising a scalable message; and	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Kahn, it would have been obvious to a person ordinary skill in the art to combine and/or modify Kahn with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than

	they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are

	desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type

	ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43.

	In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector that is a redundancy check error detector; and	"For the following discussion, we refer to the operation of an experimental packet radio, in which a transmitted packet has the structure shown in Fig. 8. It consists of a 48 bit preamble followed by a variable length header (typically 96-144 bits)

Exhibit P1 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Kahn

	followed by the text and a 32 bit checksum." Kahn page 1478. Figure 8, Kahn page 1479. "We assume an end-to-end error detection and retransmission technique to be used in the network for reliable delivery of individual packets. Each source/destination pair on the network could utilize an end-to-end protocol such as described in [38], which also supports internetworking." Kahn page 1481. "When a packet is transmitted, the preamble, header and text are read from microprocessor memory under direct memory access (DMA) control. The radio unit completes the packet format previously illustrated in Fig. 8 by adding a 32 bit cyclic redundancy checksum (CRC), then differentially encodes the data, and adds (modulo two) the appropriate PN chip pattern for the selected data rate." Kahn page 1490.
wherein the steps of sending and receiving are repeated until the message is received by the intended receiver.	"We assume an end-to-end error detection and retransmission technique to be used in the network for reliable delivery of individual packets. Each source/destination pair on the network could utilize an end-to-end protocol such as described in [38], which also supports internetworking." Kahn page 1481.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 7,697,492 based on Jubin

The '492 Patent – Claim	J. Jubin et al., "*The DARPA Packet Radio Network Protocols,*" Proceedings of the IEEE, Vol. 75, No. 1, January 1987.
1. In a communication system to communicate command and sensed data between remote devices, the system comprising:	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated. As a communication medium, broadcast radio (as opposed to wires and antenna-directed radio) provides important advantages to the user of the network." Jubin page 21.
a receiver address comprising a scalable address of at least one remote device;	"*A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to

	eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and

	"network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields.

	Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a command indicator comprising command code;	"PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below.

	For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60.

	"During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet

	network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a data value comprising a scalable message; and	*"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header.

	ETE Header: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g.,

	information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some

	information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43.

	In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a controller associated with a remote device comprising a transceiver configured to send and receive wireless signals, the remote device configured to send a preformatted message comprising the receiver address, a command indicator, and the data value via the transceiver to at least one other remote device.	"In order for a user to send data across a PRNET, a device (such as a small host computer) must be connected to a packet radio via a HDLC wire interface." Jubin page 22. "The LPR consists of both digital and RF subsystems. … The

	digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 "Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. …The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header." Jubin page 25. *"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25. "D. Receive Measurements Several measurements on the receive side are provided to the software: receive power (AGC), signal + noise, noise, multipath,

	and FEC error count.. These can be used to better quantify the link qualities between neighboring PRs (Section III-A) that provide the basis for the PRNET routing algorithms (Section III-B)." Jubin page 31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247.

	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses:

	"Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed

	through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
2. The system of claim 1, further comprising:	The above contentions for claim 1 are hereby incorporated by reference.
a plurality of transceivers each having a unique address, the transceiver being one of the plurality of transceivers;	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin page 22. "In order for a user to send data across a PRNET, a device (such as a small host computer) must be connected to a packet radio via a HDLC wire interface." Jubin page 22. "The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22.

	"*ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
a plurality of controllers associated with each the controller associated with at least one of the transceivers, the controller being in communication with at least one other transceiver with a preformatted message, the preformatted message having at least one scalable field;	"The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43.

	'252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition

	to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing:

	Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing
at least one sensor associated with at least one of the transceivers to detect a condition and output a data signal to the transceiver; and	"Another host computer function called Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.

	"D. Receive Measurements Several measurements on the receive side are provided to the software: receive power (AGC), signal + noise, noise, multipath, and FEC error count.. These can be used to better quantify the link qualities between neighboring PRs (Section III-A) that provide the basis for the PRNET routing algorithms (Section III-B)." Jubin page 31.
at least one actuator associated with at least one of the transceivers to activate a device.	"PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 "*Adaptive Power Control*: The hardware provides the software the capability to select, on a packet-by-packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31.
3. The system of claim 1, wherein the controller sends the preformatted message via an associated transceiver, and at least one transceiver sends the preformatted response message.	The above contentions for claim 1 are hereby incorporated by reference. "The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets

	between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23
4. The system of claim 1, wherein at least one transceiver receives the preformatted message requesting sensed data, confirms the receiver address as its own unique address, receives a sensed data signal, formats the sensed data signal into scalable byte segments, determines the number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet.	The above contentions for claim 1 are hereby incorporated by reference. "The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are

	available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules

	belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39.

	"FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source

	Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing
6. The system of claim 1, wherein each remote device is adapted to transmit and receive radio frequency transmissions to and from at least one other transceiver.	The above contentions for claim 1 are hereby incorporated by reference. "The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22.
8. A method of communicating command and sensed data between remote wireless devices, the method comprising:	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated. As a communication medium, broadcast radio (as opposed to wires and antenna-directed radio) provides important advantages to the user of the network." Jubin page 21.

providing a receiver to receive at least one message;	"The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22.
wherein the message has a packet comprising a command indicator comprising a command code, a scalable data value comprising a scalable message, and an error detector that is a redundancy check error detector; and	"In order for a user to send data across a PRNET, a device (such as a small host computer) must be connected to a packet radio via an HDLC wire interface." Jubin page 22. "Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. …The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header." Jubin page 25. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "C. *Error control* *Forward Error Correction:* The LPR uses long convolutional codes and sequential decoding to perform forward error correction (FEC). … The LPR also has hardware to generate a

	32-bit cyclic redundancy checksum (CRC)." Jubin page 27. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central

	station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer

	operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the

	system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to

	individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message

	includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space.

	Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing
providing a controller to determine if at least one received message is a duplicate message and determining a location from which the duplicate message originated.	*"Forwarding:* Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's headers and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26. "Other PRs within range also receive each transmitted packet. For example, L's transmission is received not only by M but also by P and Q. Since neither P nor Q is the next PR in the routing header, they both discard the packet." Jubin page 26.
9. The method of claim 8, further comprising providing at least one remote wireless communication device, wherein at least one of the devices comprise geographically remote transceivers adapted to transmit and receive at least one message using radio	The above contentions for claim 8 are hereby incorporated by reference. "The PRNET provides, via a common radio channel, the

frequency transmissions.	exchange of data between computers that are geographically separated. As a communication medium, broadcast radio (as opposed to wires and antenna-directed radio) provides important advantages to the user of the network." Jubin page 21.
10. The method of claim 8, further comprising providing at least one remote wireless communication device, wherein at least one of the devices has a unique address and the packet further comprises at least one scalable address field to contain the unique address for at least one device.	The above contentions for claim 8 are hereby incorporated by reference. "*ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43.

	'252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network

	service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP

	addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing
11. The method of claim 8, further comprising providing an actuator associated with at least one of the remote devices, the actuator configured to actuate in response to the command code.	The above contentions for claim 8 are hereby incorporated by reference. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 "*Adaptive Power Control*: The hardware provides the software the capability to select, on a packet-by-packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31.
13. The method of claim 8, further comprising determining if an error exists in a packet of the at least one message.	The above contentions for claim 8 are hereby incorporated by reference. "C. *Error control* *Forward Error Correction:* The LPR uses long convolutional codes and sequential decoding to perform forward error correction (FEC). … The LPR also has hardware to generate a 32-bit cyclic redundancy checksum (CRC)." Jubin page 27.
14. A wireless communication device for use in a communication system to communicate command and sensed data between remote wireless communication devices, the wireless communication device comprising:	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated. As a communication medium, broadcast radio (as opposed to wires and antenna-directed radio) provides important advantages to the user of the network." Jubin page 21.
a transceiver configured to send and receive wireless communications; and	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically

	separated. As a communication medium, broadcast radio (as opposed to wires and antenna-directed radio) provides important advantages to the user of the network." Jubin page 21. "The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin page 22. "In order for a user to send data across a PRNET, a device (such as a small host computer) must be connected to a packet radio via a HDLC wire interface." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22.
a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to format a message comprising a receiver address comprising a scalable address of at least one remote wireless device; a command indicator comprising a command code, a data value comprising a scalable message.	"The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are

	available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 "Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. …The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header." Jubin page 25. *"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses:

	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once

	every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19.

	U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the

	length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the

	information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet."

	'252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing

15. The wireless communication device of claim 14, further comprising at least one sensor configured to detect a condition and output a signal to the controller.	The above contentions for claim 14 are hereby incorporated by reference. "Another host computer function called Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23. "D. Receive Measurements Several measurements on the receive side are provided to the software: receive power (AGC), signal + noise, noise, multipath, and FEC error count.. These can be used to better quantify the link qualities between neighboring PRs (Section III-A) that provide the basis for the PRNET routing algorithms (Section III-B)." Jubin page 31.
16. The wireless communication device of claim 14, wherein the controller is further configured to determine if at least one received message is a duplicate message and determine a location from which the duplicate message originated.	The above contentions for claim 14 are hereby incorporated by reference. *"Forwarding:* Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's headers and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26.

	"Other PRs within range also receive each transmitted packet. For example, L's transmission is received not only by M but also by P and Q. Since neither P nor Q is the next PR in the routing header, they both discard the packet." Jubin page 26.
17. The wireless communication device of claim 14, further comprising at least one actuator configured to implement an action corresponding to the command code.	The above contentions for claim 14 are hereby incorporated by reference. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 "*Adaptive Power Control*: The hardware provides the software the capability to select, on a packet-by-packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No.

	5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses:

	"Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message

	with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
18. The device of claim 14, wherein the transceiver comprises a unique transceiver address to distinguish the transceiver from other transceivers.	The above contentions for claim 14 are hereby incorporated by reference.

	"*ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
19. In a system for communicating commands and sensed data between remote devices comprising a communications device for communicating commands and sensed data, the communications device comprising:	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated. As a communication medium, broadcast radio (as opposed to wires and antenna-directed radio) provides important advantages to the user of the network." Jubin page 21.
a transceiver operably configured to be in communication with at least one other of a plurality of transceivers, wherein the transceiver has a unique address, wherein the unique address identities the individual transceiver, wherein the transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with each of the other transceivers via preformatted messages;	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated. As a communication medium, broadcast radio (as opposed to wires and antenna-directed radio) provides important advantages to the user of the network." Jubin page 21. "The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22. Figure 6, Jubin page 25.

	"Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. …The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header." Jubin page 25. *"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
a controller configured to be in communication with the transceiver, the controller configured to provide preformatted messages for communication;	"In order for a user to send data across a PRNET, a device (such as a small host computer) must be connected to a packet radio via a HDLC wire interface." Jubin page 22. "The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22.
wherein the preformatted message comprises at least one packet, wherein the packet comprises: a receiver address comprising a scalable address of the at least one of the intended receiving transceivers; sender address comprising the unique address of the sending transceiver; a command indicator comprising a command code; at least one data value comprising a scalable message; and	"Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. …The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header." Jubin page 25. *"ETE Header*: The ETE header is created by the source device.

an error detector comprising a redundancy check error detector; and wherein the controller is configured to interact with the transceiver to send preformatted command messages.	It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "C. *Error control* *Forward Error Correction:* The LPR uses long convolutional codes and sequential decoding to perform forward error correction (FEC). … The LPR also has hardware to generate a 32-bit cyclic redundancy checksum (CRC)." Jubin page 27. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below.

	For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60.

	"During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet

	network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link

	packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for

	each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43

	illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.

20. The communication device of claim 19, further comprising a sensor operatively configured to detect a condition and output a sensed data signal that corresponds to the condition to the transceiver.	The above contentions for claim 19 are hereby incorporated by reference. "Another host computer function called Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23. "D. Receive Measurements Several measurements on the receive side are provided to the software: receive power (AGC), signal + noise, noise, multipath, and FEC error count.. These can be used to better quantify the link qualities between neighboring PRs (Section III-A) that provide the basis for the PRNET routing algorithms (Section III-B)." Jubin page 31.
21. The communication device of claim 20, wherein the transceiver is configured to receive a preformatted command message requesting sensed data, confirms the receiver address is its own unique address, receives the sensed data signal, formats the sensed data signal into scalable byte segments, determines a number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet.	The above contentions for claim 20 are hereby incorporated by reference. "The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page

	22. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25.

	"The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the

	first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385,

	November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing
25. A wireless communication device for use in a communication system to communicate a number of commands and sensed data between remote wireless communication devices, the wireless communication device comprising:	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated. As a communication medium, broadcast radio (as opposed to wires and antenna-directed radio) provides important advantages to the user of the network." Jubin page 21.
a transceiver configured to send and receive wireless communications; and	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated. As a communication medium, broadcast radio (as opposed to wires and antenna-directed radio) provides important

	advantages to the user of the network." Jubin page 21. "The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin page 22. "In order for a user to send data across a PRNET, a device (such as a small host computer) must be connected to a packet radio via a HDLC wire interface." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. …Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22. Figures 2 and 6, Jubin pages 22, 25.

a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to reformat a message comprising receiver address comprising a scalable address of at least one remote wireless device; a command indicator comprising a command code; a data value comprising a scalable message.	"The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 "Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. …The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header." Jubin page 25. "*ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25. "IV. Forwarding Protocols

	Despite the local broadcast nature of the packet radio, a user packet is not flooded throughout the PRNET to get to its destination because multiple-hop flooding would use too much of the finite capacity of the network's common channel. Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B). … Forwarding is accomplished via information read from the device and tier tables (Sections III-B and III-C) and from the packet headers (Section IV-A). Forward error correction increases the probability of error-free reception and cyclic redundancy checksums prevent, with high probability, the forwarding of packets that are not error-free (Section IV-C)." Jubin page 25. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected

	devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its

	most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters

	and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g.,

	information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some

	information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43.

	In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 7,468,661 based on Jubin

The '661 Patent – Claim	J. Jubin et al., "*The DARPA Packet Radio Network Protocols,*" Proceedings of the IEEE, Vol. 75, No. 1, January 1987.
1. A system for remote data collection, assembly, storage, and event detection and reporting, comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21. "The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23. "Another application of packet radio networks currently being explored in the requirement for providing distributed access to either distributed or centralized information." Jubin page 31.
a computer configured to execute at least one computer program	Figure 4, Jubin page 23.

that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
a plurality of transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22.

	"Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless	Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an

transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN.	Internet gateway." Jubin p. 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, p. 22
5. A system for monitoring remote devices, comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
at least one sensor adapted to generate an electrical signal in response to a physical condition;	"Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality,

	nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
at least one wireless transmitter electrically interfaced with the sensor and configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a radio-frequency (RF) signal;	"The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6.
one or more additional wireless transmitters each electrically interfaced with a sensor and configured to receive the RF signal and retransmit the RF signal;	"Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an

Exhibit P2 – Invalidity Chart for U.S. Patent No. 7,468,661 based on Jubin

	attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. Figs. 2 and 6.
at least one gateway connected a wide area network (WAN) configured to receive and translate the retransmitted RF signal, the gateway further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN; and	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin p. 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, p. 22
a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.	"Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
6. The system of claim 5, wherein the at least one gateway is permanently connected to the WAN.	The above contentions for claim 5 are hereby incorporated by reference. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin p. 23.

	"Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, p. 22
8. The system of claim 5, wherein the gateway translates the encoded electrical signal, the transmitter identification and the transceiver identification information into TCP/IP for communication over the WAN.	The above contentions for claim 5 are hereby incorporated by reference. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin p. 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, p. 22
9. A system for controlling a remote device comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to

	organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
a target remote device having an actuator to be controlled;	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "All commands available to a local operator are available to a remote operator. The remote operator can load/debug not only a PR that is executing the regular protocol software, but also a 'frozen' PR, that is, a PR that has stopped executing the regular program because of a self-detected fault." Jubin page 23. "Adaptive Power Control: The hardware provides the software the capability to select, on a packet-by-packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmissions from various-distanced PRs at each receiver, to mitigate the 'near-far' problem." Jubin page 31.

a computer configured to execute at least one computer program that generates at least one control signal responsive to a system input signal; said computer integrated with a wide area network (WAN);	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin p. 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, p. 22 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or

Exhibit P2 – Invalidity Chart for U.S. Patent No. 7,468,661 based on Jubin

	modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248.

	U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51.

	U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a gateway connected to the WAN configured to receive and	"The PRNET can also be accessed from other networks via an

translate the at least one control signal	Internet gateway." Jubin p. 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, p. 22
a wireless transmitter coupled with the gateway for transmitting a wireless signal that contains the control signal;	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22.
a first wireless transceiver electrically interfaced with an actuator for receiving the wireless signal and further retransmitting the wireless signal to the target remote device; and	"Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. Figs. 2 and 6. "Adaptive Power Control: The hardware provides the software

	the capability to select, on a packet-by-packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmissions from various-distanced PRs at each receiver, to mitigate the 'near-far' problem." Jubin page 31.
logic coupled to the target remote device for extracting the control signal from the retransmitted wireless signal and imparting an action on the actuator in response to the extracted control signal.	"Adaptive Power Control: The hardware provides the software the capability to select, on a packet-by-packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmissions from various-distanced PRs at each receiver, to mitigate the 'near-far' problem." Jubin page 31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted,

	if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the

	command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS

	message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
10. The system of claim 9, further comprising:	The above contentions for claim 9 are hereby incorporated by reference.
a plurality of additional wireless transceivers each coupled to an actuator and configured to receive the wireless signal and to retransmit the wireless signal, wherein one of the plurality of additional wireless transceivers receive the wireless signal from the wireless transmitter and another one of the plurality of the additional wireless transceivers retransmits the wireless signal to the first wireless transceiver.	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication

	network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Adaptive Power Control: The hardware provides the software the capability to select, on a packet-by-packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmissions from various-distanced PRs at each receiver, to mitigate the 'near-far' problem." Jubin page 31.
11. The system of claim 9, further comprising:	The above contentions for claim 9 are hereby incorporated by reference.
a plurality of additional wireless transceivers each coupled to an actuator or a sensor and configured to receive the wireless signal and to retransmit the wireless signal, wherein one of the plurality of additional wireless transceivers receive the wireless signal from the wireless transmitter and another one of the plurality of the additional wireless transceivers retransmits the wireless signal to the first wireless transceiver.	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22.

	"Adaptive Power Control: The hardware provides the software the capability to select, on a packet-by-packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmissions from various-distanced PRs at each receiver, to mitigate the 'near-far' problem." Jubin page 31.
12. A system for remote data collection, assembly, storage, and event detection and reporting, comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21. "The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor

	will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23. "Another application of packet radio networks currently being explored in the requirement for providing distributed access to either distributed or centralized information." Jubin page 31.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	Figure 4, Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
a plurality of non-earth orbiting transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data

information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"ETE Header*: The ETE header is created by the source device.

	It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN.	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin p. 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, p. 22
14. The system as defined claim 12, wherein the gateway translates the encoded electrical signal, the transmitter identification, and the transceiver identification information into TCP/IP for communication over the WAN.	The above contentions for claim 12 are hereby incorporated by reference. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin p. 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA

	Internet." Jubin, p. 22

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Jubin

The '692 Patent – Claim	J. Jubin et al., "*The DARPA Packet Radio Network Protocols,*" Proceedings of the IEEE, Vol. 75, No. 1, January 1987.
1. A system for remote data collection, assembly, and storage comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21. "The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23. "Another application of packet radio networks currently being explored in the requirement for providing distributed access to either distributed or centralized information." Jubin page 31.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	Figure 4, Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and

	debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
at least one wireless transmitter configured to transmit select information and transmitter identification information;	"The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6.
a plurality of relatively low-power radio-frequency (RF) transceivers dispersed geographically at	"The PRNET system comprises:

defined locations configured to receive select information transmitted from at least one nearby wireless transmitter and further configured to transmit the select information, the transmitter identification information and transceiver identification information; and	• The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR

	correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
at least one gateway connected to the wide area network configured to receive and translate the select information, the transmitter identification information, and transceiver identification information, said gateway further configured to farther transmit the translated information to the computer over the WAN.	Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22.
3. The system as defined in claim 1, wherein each wireless transmitter is configured to transmit a relatively low-power, radio-frequency (RF) signal.	The above contentions for claim 1 are hereby incorporated by reference. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22.
4. The system as defined in claim 1, wherein each	The above contentions for claim 1 are hereby incorporated by reference.

wireless transmitter is integrated with a sensor.	"Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding network behavior." Jubin page 23.
5. The system as defined in claim 1, wherein the RF signal transmitted by the receiver contains a concatenation of information comprising select information and transmitter identification information from the originating transmitter and transceiver identification information for each transceiver that receives and repeats the RF signal.	The above contentions for claim 1 are hereby incorporated by reference. "*A. Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. ETE Header: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B_. Also in the ETE header is a type-of – service flag that the source PR transfers to the routing header to customize forwarding for low delay/reliability applications such as speech (Section V-D). The ETE headers stays on the packet from its creation by the source device throughout its forwarding through the PRNET including its delivery to the destination device. Routing Header: The routing header is created by the source PR, encapsulating the ETE header. … The routing header stays on the packet throughout its forwarding throughout the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR, The rest of the fields are updated by

	every intermediate packet radio." Jubin pages 25-26. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
6. The system as defined in claim 5, wherein the at least one transmitter is replaced by a transceiver, the transceiver further integrated with an actuator.	The above contentions for claim 5 are hereby incorporated by reference. "The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer

	or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"Adaptive Power Control:* The hardware provides the software the capability to select, on a packet-by-packet basis, the attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31.
7. The system as defined in claim 6, wherein the transceivers are configured to communicate with the gateway via a RF signal.	The above contentions for claim 6 are hereby incorporated by reference. "A host computer may be directly interfaced to a PR. If a user wished to send data across the PRNET from a terminal or host that does not run the required protocols, a Network Interface Unit (NIU)[8], Fig. 3, may be used between the terminal or host and the PR." Jubin page 22. Figure 4, Jubin page 23.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Jubin

8. The system as defined in claim 7, wherein the computer is further configured to respond to received select information by communicating a control signal to at least one transceiver, wherein the actuator integrated with the transceiver is responsive to the control signal.	The above contentions for claim 7 are hereby incorporated by reference. *"Adaptive Power Control:* The hardware provides the software the capability to select, on a packet-by-packet basis, the attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31.
11. The system as defined in claim 1, wherein the gateway includes one selected from the group consisting of:	The above contentions for claim 1 are hereby incorporated by reference.
a modem for establishing a dial-up connection with a remote computer; a network card for communicating across a local area network; a network card for communicating across the WAN, a DSL modem; and an ISDN card to permit backup access to the computer.	"Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "A host computer may be directly interfaced to a PR. If a user wished to send data across the PRNET from a terminal or host that does not run the required protocols, a Network Interface Unit (NIU)[8], Fig. 3, may be used between the terminal or host and the PR." Jubin page 22. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.

12. The system as defined in claim 1, wherein the gateway translates the select information, the transmitter identification, and the transceiver identification information to TCP/IP for communication over the WAN.	The above contentions for claim 1 are hereby incorporated by reference. "A. Packet Headers Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. ETE Header: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). Also in the ETE header is a type-of – service flag that the source PR transfers to the routing header to customize forwarding for low delay/reliability applications such as speech (Section V-D). The ETE headers stays on the packet from its creation by the source device throughout its forwarding through the PRNET including its delivery to the destination device. Routing Header: The routing header is created by the source PR, encapsulating the ETE header. … The routing header stays on the packet throughout its forwarding throughout the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR, The rest of the fields are updated by every intermediate packet radio." Jubin pages 25-26.
13. The system as defined in claim 1, wherein the WAN is the Internet.	The above contentions for claim 1 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard

	internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page

	22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP)

	signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2.

	The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
14. The system as defined in claim 1, wherein the WAN is a dedicated Intranet.	The above contentions for claim 1 are hereby incorporated by reference. "Note that, organizationally, the devices lie outside the PRNET subnet: the network appears as a black box providing packet communication service between pairs of user devices. Jubin page 23. Fig. 4, Jubin page 23.
24. A method for controlling a system comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21.
remotely collecting data from at least one sensor;	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting the community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin page 22.

	"Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
processing the data into a radio-frequency (RF) signal;	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6.
transmitting the RF signal, via a relatively low-	"Each PR is responsible for receiving a packet and relaying it on to a PR that is

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Jubin

power transceiver, to a gateway;	one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22.
translating the data in the RF signal into a network transfer protocol;	"A host computer may be directly interfaced to a PR. If a user wished to send data across the PRNET from a terminal or host that does not run the required protocols, a Network Interface Unit (NIU)[8], Fig. 3, may be used between the terminal or host and the PR." Jubin page 22. Figure 4, Jubin page 23.
sending the translated data to a computer, wherein the computer is configured to appropriately respond to the data generated by the at least one sensor by generating an appropriate control signal;	"PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator. The remote operator can load/debug not only a PR that is executing the regular protocol software, but also a "frozen" PR, that is, a PR that has stopped executing the regular program because of a elf-detected fault." Jubin page 23.
sending the control signal via the network to the gateway,	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23.
translating the control signal from a network transfer protocol into an RF control signal;	"The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22.

	Figs. 2 and 6. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator. The remote operator can load/debug not only a PR that is executing the regular protocol software, but also a "frozen" PR, that is, a PR that has stopped executing the regular program because of a self-detected fault." Jubin page 23 "Single-hop radio networks are also being used to improve the efficiency of commercial operations. For example, the use of a small hand-held radio with a limited keyboard is being experimented with by restaurants. The waiters, bartenders, and cooks are all equipped with a packet radio. The waiter enters and order and its destination (either the bartender or the cook), then waits to receive a packet indicating that the order has been completed." Jubin page 32.
transmitting the RF control signal;	"The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6.
receiving the RF control signal;	"The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF

	subsystems." Jubin, p. 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6.
translating the received RF control signal into an analog signal; and	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22.

	Figs. 2 and 6.
applying the analog signal to an actuator to effect the desired system response.	*"Adaptive Power Control:* The hardware provides the software the capability to select, on a packet-by-packet basis, the attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31.
25. The method of claim 24, wherein the RF signal contains a concatenation of information comprising encoded data information and transmitter identification information from an originating transmitter.	The above contentions for claim 24 are hereby incorporated by reference. "*A. Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. ETE Header: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). Also in the ETE header is a type-of – service flag that the source PR transfers to the routing header to customize forwarding for low delay/reliability applications such as speech (Section V-D). The ETE headers stays on the packet from its creation by the source device throughout its forwarding through the PRNET including its delivery to the destination device. Routing Header: The routing header is created by the source PR, encapsulating the ETE header. … The routing header stays on the packet throughout its

	forwarding throughout the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR, The rest of the fields are updated by every intermediate packet radio." Jubin pages 25-26. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
26. The method of claim 25, wherein the step of transmitting the RF signal is further performed by at least one transceiver, wherein the transceiver is configured to concatenate a transceiver identification code to the RF signal.	The above contentions for claim 25 are hereby incorporated by reference. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6.

	"*A. Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. ETE Header: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). Also in the ETE header is a type-of – service flag that the source PR transfers to the routing header to customize forwarding for low delay/reliability applications such as speech (Section V-D). The ETE headers stays on the packet from its creation by the source device throughout its forwarding through the PRNET including its delivery to the destination device. Routing Header: The routing header is created by the source PR, encapsulating the ETE header. … The routing header stays on the packet throughout its forwarding throughout the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR, The rest of the fields are updated by every intermediate packet radio." Jubin pages 25-26.
27. The method of claim 25, wherein the step of transmitting the RF control signal is further performed by at least one transceiver, wherein the transceiver is configured to receive and transmit the RF control signal.	The above contentions for claim 25 are hereby incorporated by reference. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22.

	"The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "A. Packet Headers Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. ETE Header: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). Also in the ETE header is a type-of – service flag that the source PR transfers to the routing header to customize forwarding for low delay/reliability applications such as speech (Section V-D). The ETE headers stays on the packet from its creation by the source device throughout its forwarding through the PRNET including its delivery to the destination device. Routing Header: The routing header is created by the source PR, encapsulating the ETE header. … The routing header stays on the packet throughout its forwarding throughout the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR, The rest of the fields are updated by

	every intermediate packet radio." Jubin pages 25-26. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator. The remote operator can load/debug not only a PR that is executing the regular protocol software, but also a "frozen" PR, that is, a PR that has stopped executing the regular program because of a elf-detected fault." Jubin page 23
28. The method of claim 25, wherein the steps of translating and applying the received RF control signal are performed only by an identified transceiver electrically integrated with an actuator.	The above contentions for claim 25 are hereby incorporated by reference. *"Adaptive Power Control:* The hardware provides the software the capability to select, on a packet-by-packet basis, the attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31.
29. The method of claim 25, wherein the network is the Internet.	The above contentions for claim 25 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. "A host computer may be directly interfaced to a PR. If a user wished to send

	data across the PRNET from a terminal or host that does not run the required protocols, a Network Interface Unit (NIU)[8], Fig. 3, may be used between the terminal or host and the PR." Jubin page 22. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections

	between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. ‘217 patent discloses: “The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module.” ‘217 patent, 46:11-16.

	'650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses:

	"FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
30. The method of claim 25, wherein the network is an Intranet.	The above contentions for claim 25 are hereby incorporated by reference. "Note that, organizationally, the devices lie outside the PRNET subnet: the network appears as a black box providing packet communication service between pairs of user devices. Jubin page 23. Fig. 4, Jubin page 23.
31. The method of claim 25, wherein the network transfer protocol is TCP/IP.	The above contentions for claim 25 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example:

	Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol

	congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. ‘217 patent discloses: “The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module.” ‘217 patent, 46:11-16. ‘650 patent discloses “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112.

	However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP

	protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
32. A system for monitoring remote devices comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21.
at least one sensor adapted to generate an electrical signal in response to a physical condition;	"PRs can be loaded and debugged from a remote host computer. All commands available to a local operation are available to a remote operator." Jubin page 23. "A plethora of terminal commands—display memory alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available to for local debugging." Jubin page 23. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
at least one wireless transmitter configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a low-power radio-frequency (RF) signal;	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users.

	• The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. "A. Packet Headers Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. ETE Header: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored device-PR

	correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). Also in the ETE header is a type-of –service flag that the source PR transfers to the routing header to customize forwarding for low delay/reliability applications such as speech (Section V-D). The ETE headers stays on the packet from its creation by the source device throughout its forwarding through the PRNET including its delivery to the destination device. Routing Header: The routing header is created by the source PR, encapsulating the ETE header. … The routing header stays on the packet throughout its forwarding throughout the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR, The rest of the fields are updated by every intermediate packet radio." Jubin pages 25-26.
at least one gateway connected a wide area network (WAN) configured to receive and translate the RF signal, the gateway further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN; and	"Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.
a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for	Figure 4, Jubin page 23. "A plethora of terminal commands – display memory, alter memory,

retrieval upon demand from a remotely located device.	select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
34. The system defined in claim 32, wherein each wireless transmitter is configured to transmit a relatively low-power radio-frequency (RF) signal.	The above contentions for claim 32 are hereby incorporated by reference. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22.
36. The system defined in claim 32, wherein the gateway translates the encoded electrical signal, the transmitter identification, and the transceiver identification information into TCP/IP for communicating over the WAN.	The above contentions for claim 32 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22.

	Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and

	TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from

	the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2.

	Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
37. The system defined in claim 32, wherein the WAN in the Internet.	The above contentions for claim 32 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22

	"When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

	‘650 patent discloses “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art.” ‘650 patent, 6:11-26. “Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers.” ‘650 patent, 8:42-44. “For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112.” ‘650 patent, 10:54-57. ‘773 patent discloses: “Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." ‘773 patent, 7:39-43. ‘773 patent, Figure 2. The ‘817 patent discloses:

	"FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
38. The system defined in claim 32, wherein the WAN is a dedicated Intranet.	The above contentions for claim 32 are hereby incorporated by reference. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494.

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Jubin

	"Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26.

	"Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
42. A system for controlling remote devices comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21.
a computer configured to execute at least one	Figure 4, Jubin page 23.

computer program that generates at least one control signal responsive to a system input signal; said computer integrated with a wide area network (WAN);	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
at least one gateway connected to the WAN configured to receive and translate the at least one control signal; said gateway further configured to transmit a radio-frequency (RF) signal containing the control signal and destination information;	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "The digital subsystem controls the routing and flow of packets between PRs

	while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.
at least one wireless low-power RF transceiver configured to receive the RF signal from the gateway; said wireless transceiver configured to translate the RF signal to an analog output signal, the wireless transceiver electrically coupled with an actuator; and	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22.

	"The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
an actuator configured to receive the analog output signal from the wireless transceiver, the actuator further configured to translate the analog output signal into a response.	"PRs can be loaded and debugged from a remote host computer. All commands available to a local operation are available to a remote operator." Jubin page 23. "A plethora of terminal commands—display memory alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available to for local debugging." Jubin page 23. *"Adaptive Power Control:* The hardware provides the software the capability to select, on a packet-by-packet basis, the attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-

	far" problem." Jubin page 31.
43. The system defined in claim 42, the system input signal comprising:	The above contentions for claim 42 are hereby incorporated by reference
a concatenation of information including data from a sensor, transceiver identification information from the originating transceiver, and transceiver identification information for each transceiver that receives and repeats the RF signal.	"A. Packet Headers Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. ETE Header: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B_. Also in the ETE header is a type-of – service flag that the source PR transfers to the routing header to customize forwarding for low delay/reliability applications such as speech (Section V-D). The ETE headers stays on the packet from its creation by the source device throughout its forwarding through the PRNET including its delivery to the destination device. Routing Header: The routing header is created by the source PR, encapsulating the ETE header. … The routing header stays on the packet throughout its forwarding throughout the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR, The rest of the fields are updated by every intermediate packet radio." Jubin pages 25-26. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of

	one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
46. The system defined in claim 42, wherein the gateway translates the RF signal and the RF control signal into TC/IP for communication over the WAN.	The above contentions for claim 42 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is

	accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the

	destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. ‘217 patent discloses: “The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module.” ‘217 patent, 46:11-16. ‘650 patent discloses “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As

	shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

47. The system defined in claim 42, wherein the WAN is the Internet.	The above contentions for claim 42 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494.

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250.

	"Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26.

	"Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
48. The system defined in claim 42, wherein the WAN is a dedicated Intranet.	The above contentions for claim 42 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between

	hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. "Note that, organizationally, the devices lie outside the PRNET subnet: the network appears as a black box providing packet communication service between pairs of user devices. Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Jubin discloses:

	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway

	function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44.

	"For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
49. A system for managing an arrangement of application specific remote devices comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21. "The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21.

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23. "Another application of packet radio networks currently being explored in the requirement for providing distributed access to either distributed or centralized information." Jubin page 31.
a computer configured to execute a multiplicity of computer programs, each computer program executed to generate at least one control signal in response to at least one application system input, said computer integrated with a wide area network (WAN);	Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet

	radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
at least one gateway connected to the WAN configured as a two-way communication device to receive and translate the at least one control signal and the at least one application system input; said gateway further configured to translate and transmit a radio-frequency (RF) signal containing the control signal and destination information, said gateway further configured to receive and translate the at least one application system input and source information;	Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
at least one wireless relatively low-power RF transceiver per computer program configured to receive the RF signal from the gateway; said wireless transceiver configured to translate the RF signal to an analog output signal, the wireless	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached

transceiver electrically coupled with an actuator and a sensor;	to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
an actuator configured to receive the analog output signal from the wireless transceiver, the actuator further configured to translate the analog output signal into a response; and	"PRs can be loaded and debugged from a remote host computer. All commands available to a local operation are available to a remote operator." Jubin page 23. "A plethora of terminal commands—display memory alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available to for local debugging." Jubin page 23. *"Adaptive Power Control:* The hardware provides the software the capability to select, on a packet-by-packet basis, the attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31.
a sensor configured to translate a physical condition into an analog version of the application system	"Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers

input.	measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
51. The system as defined in claim 49, wherein the at least one gateway translates the RF signal and the RF control signal into TCP/IP for communication over the WAN.	The above contentions for claim 49 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station

	processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. …

	2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. ‘217 patent discloses: “The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module.” ‘217 patent, 46:11-16. ‘650 patent discloses “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors

	110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Jubin

52. The system as defined in claim 49, wherein the WAN in the Internet.	The above contentions for claim 49 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494.

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249.

	Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26.

	"Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
53. The system as defined in claim 49, wherein the WAN is a dedicated Intranet.	The above contentions for claim 49 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and

	TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. "Note that, organizationally, the devices lie outside the PRNET subnet: the network appears as a black box providing packet communication service between pairs of user devices. Jubin page 23.
54. The system as defined in claim 49, wherein the at least one gateway is connected to the WAN by a network selected from the group consisting of a telecommunications network, private radio-frequency network, and a computer network.	The above contentions for claim 49 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.

	"Note that, organizationally, the devices lie outside the PRNET subnet: the network appears as a black box providing packet communication service between pairs of user devices. Jubin page 23.
55. A method of collecting information and providing data services comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21. "The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23. "Another application of packet radio networks currently being explored in the requirement for providing distributed access to either distributed or centralized information." Jubin page 31.
adaptively configuring a data translator at the output of a local controller, wherein the data translator converts the output data stream into an information	"Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and

signal consisting of a transmitter code and an information field;	TELNET). These protocols ensure that the end-to-end communication between hosts is reliable an d robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. "Note that, organizationally, the devices lie outside the PRNET subnet: the network appears as a black box providing packet communication service between pairs of user devices. Jubin page 23.
adaptively configuring at least one transmitter with the data translator, wherein the transmitter converts the information signal into a low-power RF signal;	"Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.
placing a plurality of relatively low-power radio-frequency (RF) transceivers dispersed geographically wherein the low power RF signal is	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET

received and repeated as required to communicate the information signal to a gateway, the gateway providing access to a WAN;	subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Jubin

	used in forwarding (Section IV-B)." Jubin page 25.
translating the low-power RF signal within the gateway to a WAN compatible data transfer protocol;	"Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable an d robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.
transferring the translated low-power RF signal via the WAN to a computer wherein the computer is configured to manipulate and store data provided in said signal; and	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.

granting client access to the computer.	"Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22.
56. The method of claim 55 wherein the WAN is the Internet.	The above contentions for claim 55 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.
57. The method of claim 55 wherein the WAN is an Intranet.	The above contentions for claim 49 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet

	System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Jubin discloses: "The PRNET can also be accessed from other networks via an Internet

	gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol

	and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44.

	"For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
59. The method of claim 55 wherein the clients access the information using a web browser.	The above contentions for claim 49 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page

	22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and

	TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from

	the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2.

	Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
60. A method for controlling an existing control system with a local controller comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21. "The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route

	characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23. "Another application of packet radio networks currently being explored in the requirement for providing distributed access to either distributed or centralized information." Jubin page 31.
adaptively configuring a data translator disposed between and in communication with both a local controller and a wireless transceiver, wherein the data translator is configured to translate the local controller data stream into an information signal consisting of a transceiver identification code and a concatenation of function codes, the data translator further configured to translate control signals from the wireless transceiver into local controller recognized control signals;	"Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.

remotely collecting data from the at least one relatively low-powered radio-frequency (RF) transceiver integrated with the data translator;	"Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.
processing the data into an RF signal;	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs

	while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25.
transmitting the RF signal to a gateway;	"Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6.
translating the data in the RF signal into a network transfer protocol;	Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Jubin

sending the translated data to a computer, wherein the computer is configured to appropriately respond to the data generated by at least one sensor by generating an appropriate control signal;	"Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.
sending the control signal via the network to the gateway;	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23
translating the control signal from a network transfer protocol into an RF control signal;	Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.
transmitting the RF control signal;	"Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22.

	"The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6.
receiving the RF control signal;	"Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6.
translating the received RF control signal into a local controller recognized control signal; and	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23

applying the local controller recognized control signal via a local control to effect the desired system response.	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 *"Adaptive Power Control:* The hardware provides the software the capability to select, on a packet-by-packet basis, the attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31.
61. The method of claim 60, wherein the step of transmitting the RF control signal is further performed by at least one transceiver, wherein the transceiver is configured to receive and transmit the RF control signal.	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22.

	"The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6.
62. The method of claim 60, wherein the network is the Internet.	The above contentions for claim 60 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example:

	Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol

	congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. ‘217 patent discloses: “The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module.” ‘217 patent, 46:11-16. ‘650 patent discloses “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112.

	However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP

	protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
63. The method of claim 60, wherein the network is an Intranet.	The above contentions for claim 60 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.
64. The method of claim 60, wherein the network transfer protocol is TCP/IP.	The above contentions for claim 60 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22.

	Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and

	TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from

	the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2.

	Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 8,013,732 based on Jubin

The '732 Patent – Claim	J. Jubin et al., "*The DARPA Packet Radio Network Protocols,*" Proceedings of the IEEE, Vol. 75, No. 1, January 1987.
1. A system for remote data collection, assembly, storage, event detection and reporting and control, comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21. "The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23. "Another application of packet radio networks currently being explored in the requirement for providing distributed access to either distributed or centralized information." Jubin page 31.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated	The above contentions for claim 25 are hereby incorporated by reference. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and

with a wide area network (WAN);	TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22. "A host computer may be directly interfaced to a PR. If a user wished to send data across the PRNET from a terminal or host that does not run the required protocols, a Network Interface Unit (NIU)[8], Fig. 3, may be used between the terminal or host and the PR." Jubin page 22. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and

	TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from

	the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2.

	Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
a plurality of transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission;	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21. "The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21. "The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is

	the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22.
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN and wherein at least one of said plurality of transceivers is also electrically interfaced with an actuator to control an actuated device.	The above contentions for claim 25 are hereby incorporated by reference. "Note that, organizationally, the devices lie outside the PRNET subnet: the network appears as a black box providing packet communication service between pairs of user devices. Jubin page 23. Fig. 4, Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494.

	Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical

	to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located

	anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
13. In a system comprising a plurality of wireless devices configured for remote wireless communication and comprising a device for monitoring and controlling remote devices, the device comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21. "The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and

	debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23. "Another application of packet radio networks currently being explored in the requirement for providing distributed access to either distributed or centralized information." Jubin page 31.
a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from another wireless transceiver in a predetermined signal type;	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer

	or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"A Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. … *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). …*Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25. "*Forwarding*: Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's header and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second, to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26.

the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"*Forwarding*: Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's header and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second, to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26.
a data controller operatively coupled to the transceiver and the sensor, the data controller configured to control the transceiver and receive data from the sensor, the data controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.	"The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets over the radio channel. .. Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6.

	"Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23. "*Forwarding*: Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's header and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second, to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26.
14. The device of claim 13, wherein the data controller is configured to receive data packets comprising control signals and in response to the control signals provide a control signal to an actuator for implementation of a command.	The above contentions for claim 13 are hereby incorporated by reference. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin p. 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between

	hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, p. 22 "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands—display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "*Adaptive Power Control:* The hardware provides the software with the capability to select, on a packet by packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses:

	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9

	during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses:

	"Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
16. The device of claim 13**,** wherein the data controller is configured to receive data packets comprising a function code, and in response to the function code, implement a function.	The above contentions for claim 13 are hereby incorporated by reference. Figure 4, Jubin page 23. "The PRNET can also be accessed from other networks via an Internet gateway." Jubin p. 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, p. 22 "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands—display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure,

	etc.—are available for local debugging." Jubin page 23. "*Adaptive Power Control:* The hardware provides the software with the capability to select, on a packet by packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page

	247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and

	that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

17. The device of claim 13**,** wherein the data controller is configured to format data packets for transmission via the transceiver, the data packets comprising a function code corresponding to sensed data and the unique identification code	The above contentions for claim 13 are hereby incorporated by reference. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"A Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. … *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is

	used in forwarding (Section IV-B). …*Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25. "*Forwarding*: Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's header and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second, to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses:

	"The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred

	embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

18. The device of claim 13, further comprising a memory to store one or more function codes corresponding to the device, the function codes corresponding to a number of functions the data controller can implement.	"The protocol software and replacement ("patches") to operating-system firmware in the PR can be loaded into the PR from a terminal via an RS-232 interface. A plethora of terminal commands- display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.-are available for local debugging. …PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "After a PR (say PR *L* in Fig. 2) has been powered on, and has loaded its protocol software into RAM, it begins the process of establishing and maintaining local connectivity. Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

	Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses:

	"Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions,

	commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
19. The device of claim 13, further comprising an actuator configured to receive command data from the controller and in response implement the command.	The above contentions for claim 13 are hereby incorporated by reference. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands—display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "*Adaptive Power Control:* The hardware provides the software with the capability to select, on a packet by packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below.

	For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command

	the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 8,013,732 based on Jubin

	U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
31. A wireless communication system including wireless communication devices capable of wireless communication, the wireless communication system comprising:	"In this paper we describe the current state of the DARPA packet radio network. Fully automated algorithms and protocols to organize, control, maintain, and move traffic through the packet radio network have been designed, implemented, and tested." Jubin page 21. "The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21.
at least one wireless communication device comprising a transceiver, the transceiver having a unique identification code and being interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from another wireless transceiver in a predetermined signal type;	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, p. 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF

	subsystems." Jubin, p. 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"A Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. … *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). …*Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25. "*Forwarding*: Packets are forwarded over a single path through the PRNET by

	each packet radio using the information in the packet's header and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second, to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics.. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
a controller operatively coupled to the transceiver and the sensor, the controller configured to control transceiver operations and receive data from the sensor, the controller configured to format data packets for transmission via the transceiver with at least some data packets comprising data representative of data sensed with the sensor; and	"The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "The LPR consists of both digital and RF subsystems. … The digital subsystem controls the routing and flow of packets over the radio channel. .. Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that

	is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23. "*Forwarding*: Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's header and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second, to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26.
wherein the controller is configured to receive control signals from a data packet and based on the control signals send instructions to an actuator to implement a command.	"PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands—display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23.

	"*Adaptive Power Control*: The hardware provides the software with the capability to select, on a packet by packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247.

	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data

	acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
32. The wireless communication system of claim 31, further comprising at least one gateway connected	The above contentions for claim 31 are hereby incorporated by reference.

to a WAN configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to a computing device over the WAN.	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin p. 23. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, p. 22 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example: Kahn discloses: "The PRNET is normally connected to the ARPANET. This connection is accomplished using a gateway [34] process, co-located with the network station processor, to communicate with an ARPANET IMP [2]. The station can then be remotely debugged from an authorized ARPANET host using a cross-internetwork debugger known as X-NET. By using internet protocols to access the station's X-RAY process, even the radios can be remotely debugged from the Arpanet." Kahn page 1494. Burchfiel discloses: "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and

	TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. '217 patent discloses: "The data collection module will send and receiving information to and from

	the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2.

	Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
33. The wireless communication system of claim 31, further comprising a computing device configured to receive user input and based on user input, the computing device formatting control signals, and wherein the controller is configured to receive the control signals via wireless transmission and take action based on the control signals.	The above contentions for claim 31 are hereby incorporated by reference. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands—display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "*Adaptive Power Control*: The hardware provides the software with the capability to select, on a packet by packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses:

	"Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control

	Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
34. The wireless communication system of claim 31, wherein the controller is configured to provide one or more function codes in the data packet in response to data sensed by the sensor.	The above contentions for claim 31 are hereby incorporated by reference. "The protocol software and replacement ("patches") to operating-system firmware in the PR can be loaded into the PR from a terminal via an RS-232 interface. A plethora of terminal commands- display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.-are available for local debugging. …PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

	"After a PR (say PR *L* in Fig. 2) has been powered on, and has loaded its protocol software into RAM, it begins the process of establishing and maintaining local connectivity." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when

	some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type

	Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
35. The wireless communication system of claim 31, wherein the controller comprises a memory containing a plurality of function codes specific to the sensor.	The above contentions for claim 31 are hereby incorporated by reference. "The protocol software and replacement ("patches") to operating-system firmware in the PR can be loaded into the PR from a terminal via an RS-232 interface. A plethora of terminal commands- display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure,

	etc.-are available for local debugging. …PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "After a PR (say PR *L* in Fig. 2) has been powered on, and has loaded its protocol software into RAM, it begins the process of establishing and maintaining local connectivity." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247.

	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data

	acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 8,754,780 based on Jubin

The '780 Patent – Claim	**J. Jubin et al., "*The DARPA Packet Radio Network Protocols,*" Proceedings of the IEEE, Vol. 75, No. 1, January 1987.**
1. In a system comprising a plurality of wireless devices, a device comprising:	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21.
a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from a second wireless transceiver in a predetermined signal type;	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, page 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22.

	Figs. 2 and 6. Jubin pages 22 and 25. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the second wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. *"A. Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. … The packet

	headers that are of concern to this paper are the end-to-end header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25 (see also Table of routing header fields). "The routing header stays on the packet throughout its forwarding through the PRET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin pages 25-26.
a controller operatively coupled to the transceiver and the sensor, the controller configured to control the transceiver and receive data from the sensor, the controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.	"The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. "Another host computer function called the Network Monitor is

	used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid network designers in characterizing and understanding the network behavior." Jubin page 23.
2. The device of claim 1, wherein the controller is configured to receive data packets comprising control signals and in response to the control signals provide a control signal to an actuator for implementation of a command.	The above contentions for claim 1 are hereby incorporated by reference. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses:

	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is

	preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses:

	"In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
4. The device of claim 1, wherein the controller is configured to receive data packets comprising a function code, and in response to the function code, implement a function.	The above contentions for claim 1 are hereby incorporated by reference. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 To the extent that Plaintiffs contend that this claim limitation is

	not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some

	anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition

	devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

5. The device of claim 1, wherein the controller is configured to format data packets for transmission via the transceiver, the data packets comprising a function code corresponding to sensed data and the unique identification code that identifies the transceiver.	The above contentions for claim 1 are hereby incorporated by reference. *"A. Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. … The packet headers that are of concern to this paper are the end-to-end header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted,

	if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the

	command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS

	message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
6. The device of claim 1, further comprising a memory to store one or more function codes corresponding to the device, the function codes corresponding to a number of functions the controller can implement.	The above contentions for claim 1 are hereby incorporated by reference. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23.
7. The device of claim 1, further comprising an actuator configured to receive command data from the controller and in response implement a command.	The above contentions for claim 1 are hereby incorporated by reference. "A plethora of terminal commands – display memory, alter

	memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging. ... PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23 "*Adaptive Power Control*: The hardware provides the software the capability to select, on a packet-by-packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmissions from various-distanced PRs at each receiver, to mitigate the 'near-far' problem." Jubin page 31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected

	devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its

	most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters

	and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
8. The device of claim 1, wherein the second transceiver is nearby to the transceiver.	The above contentions for claim 1 are hereby incorporated by reference. "It is the local broadcast nature of packet radio that gives the PRNET its unique networking characteristic: a PR's transmission is received by all PRs within line-of-sight; e.g., in Fig. 2, a connecting line indicates which PR's are within line-of-sight of each other." Jubin page 22.

The '842 Patent – Claim	J. Jubin et al., "*The DARPA Packet Radio Network Protocols,*" Proceedings of the IEEE, Vol. 75, No. 1, January 1987.
1. A device for communicating information, the device comprising:	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21.
a low-power transceiver configured to wirelessly transmit a signal comprising instruction data for delivery to a network of addressable devices;	'The PRNET system comprises: • The PRNET subnet, which consists if the packet radios. The PRNET subnet provides the means of interconnecting q community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time. The primary component of the packet radio communication network system is the packet radio." Jubin page 22 "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote computer." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.-are available for local debugging." Jubin page 23.
an interface circuit for communicating with a central location; and	"The LPR consists of both digital and RF subsystems. " Jubin

	page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "A host computer may be directly interfaced to a PR. If a user wishes to send data across the PRNET from a terminal or host that does not run the required protocols, a Network Interface Unit (NIU) [8], Fig. 3, may be used between the terminal or host and the PR." Jubin page 22.
a controller coupled to the interface circuit and to the low-power transceiver, the controller configured to establish a communication link between at least one device in the network of addressable devices and the central location using an address included in the signal, the communication link comprising one or more devices in the network of addressable, the controller further configured to receive one or more signals via the low-power transceiver and communicate information contained within the signals to the central location.	"The LPR consists of both digital and RF subsystems. " Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote computer." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.-are available for local debugging." Jubin page 23. "Each packet radio gathers and maintains enough information about network topology so that it can make in dependent decisions about how to route data through the network to any destination, even before it is given a packet to deliver or

	forward." Jubin page 23. "The PRNET provided a dynamic addressing capability. The DARPA packet radio network's device-to-PR mapping is known as logical addressing." Jubin page 25. "In Fig. 6, Device 1 launches a packet destined for distant Device 2. The packet is sent across the wire interface to PR L, which uses its device table to map Device-id 2 to its attached PR(*N*)." Jubin page 25. "*A. Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. …The packet headers that are of concern in this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). …*Routing Header*: The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25.
7. The device of claim 1, wherein the controller is further configured to communicate a transceiver identification code to the central location via the interface circuit.	The above contentions for claim 1 are hereby incorporated by reference. "*A. Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. …The packet headers that are of concern in this paper are the end-to-end (ETE)

	header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). …*Routing Header*: The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25.
9. The device of claim 1, wherein transmitted and received signals further comprise a field configured to indicate a destination device for a subsequent transmission path to follow.	The above contentions for claim 1 are hereby incorporated by reference. "*A. Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. …The packet headers that are of concern in this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). …*Routing Header*: The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25.
16. A device for communicating information, the device comprising:	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21.
a processor; and	"The LPR consists of both digital and RF subsystems." Jubin page 22. "The digital subsystem controls the routing and flow of packets

	between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22.
a memory, the memory comprising logical instructions that when executed by the processor are configured to cause the device to:	"Each packet radio gathers and maintains enough information about network topology so that it can make independent decisions about how to route data through the network to any destination, even before it is given a packet to deliver or forward. The network information is stored in three tables: • neighbor table • tier table • device table These tables are established by the packet radio upon initialization, and are updated automatically by the PRs as the topology changes. In the following paragraphs, we describe how the tables are established, maintained, and used. *A. Neighbor Table* After a PR (say PR L in Fig. 2) has been powered on, and has loaded its protocol software into RAM, it begins the process of establishing and maintaining local connectivity." Jubin page 23.

wirelessly transmit a signal comprising instruction data for delivery to a network of addressable low-power transceivers;	"PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote computer." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.-are available for local debugging." Jubin page 23
establish a communication ink between at least one low-power transceiver in the network of addressable low-power transceivers and a central location based on an address included in the signal, the communication link comprising one or more low-power transceivers in the network of addressable low-power transceivers; and	"Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination." Jubin page 22. "*A. Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. …The packet headers that are of concern in this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). …*Routing Header*: The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25.
receive one or more low-power RF signals and communicate information contained within the signals to the central location along with a unique transceiver identification number over the communication link.	"Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding network behavior." Jubin page 23.

17. A device for communicating information, the device comprising:	"The PRNET provides, via a common radio channel, the exchange of data between computers that are geographically separated." Jubin page 21.
a low-power transceiver that is configured to wirelessly receive a signal including an instruction data from a remote device;	"The PRNET system comprises: • The PRNET subnet, which consists if the packet radios. The PRNET subnet provides the means of interconnecting q community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time. The primary component of the packet radio communication network system is the packet radio." Jubin page 22 "Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire interface." Jubin page 22.
an interface circuit for communicating with a central location;	"The LPR consists of both digital and RF subsystems." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "A host computer may be directly interfaced to a PR. If a user wishes to send data across the PRNET from a terminal or host that does not run the required protocols, a Network Interface Unit (NIU) [8], Fig. 3, may be used between the terminal or host and

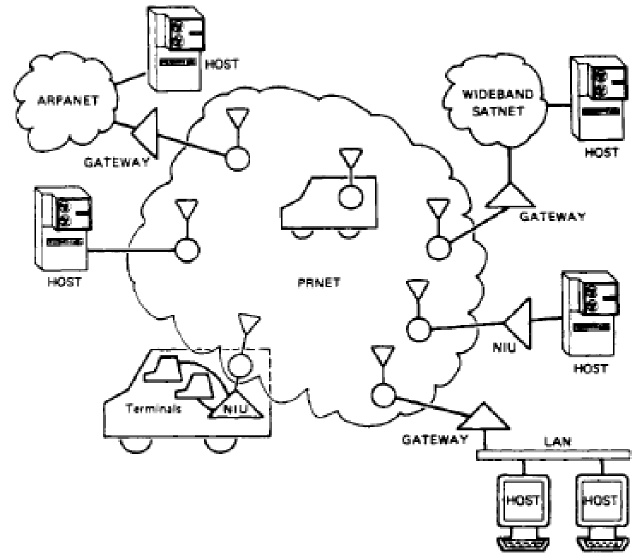
	the PR." Jubin page 22
a controller coupled to the interface circuit and the low-power transceiver, the controller being configured to establish a communication link between the remote device and the central location using address-indicative data included in the signal;	"The LPR consists of both digital and RF subsystems." Jubin page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel." Jubin page 22. "Each packet radio gathers and maintains enough information about network topology o that it can make in dependent decisions about how to route data through the network to any destination, even before it is given a packet to deliver or forward." Jubin page 23. "Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. … The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header." Jubin page 23. "The PRNET provided a dynamic addressing capability. The DARPA packet radio network's device-to-PR mapping is known as logical addressing." Jubin page 23. "In Fig. 6, Device 1 launches a packet destined for distant device 2. The packet is sent across the wire interface to PR L, which uses its device table to map Device-id 2 to its attached PR(N)." Jubin page 23.
the controller further configured to receive one or more data signals from the central location via the interface circuit and communicate information contained within the signals to the remote device.	"Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wire

	interface." Jubin page 22. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote computer." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.-are available for local debugging." Jubin page 23.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Jubin

The '893 Patent – Claim	J. Jubin et al., "*The DARPA Packet Radio Network Protocols,*" Proceedings of the IEEE, Vol. 75, No. 1, January 1987.
1. A system for communicating commands and sensed data between remote devices, the system comprising:	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, page 22. "The primary component of the packet radio communication network system is the packet radio. … This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, page 22. "Since the DARPA PRNET is a part of the DARPA Experimental Internet System [7], the devices are responsible for running the DoD-standard internetwork-, transport-, and application-level protocols (IP, TCP, and TELNET). These protocols ensure that the end-to-end communication between hosts is reliable and robust, and allow hosts on the PRNET to communicate with computers on various other packet-switched satellite, terrestrial, radio, and local area networks that also participate in the DARPA Internet." Jubin, page 22 "The PRNET can also be accessed from other networks via an Internet gateway." Jubin, page 23.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Jubin

	 Fig. 4. Packet radio network in the Internet. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin, page 23. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin, page 23.
a plurality of transceivers, each transceiver being in	"The PRNET system comprises:

communication with at least one other of the plurality of transceivers, wherein each transceiver has a unique address, wherein the unique address identities an individual transceiver, wherein each transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with the other transceivers via preformatted messages;	• The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, page 22. "This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6, Jubin pages 22 and 25. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. "*ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the

	destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
a controller, connected to one of the plurality of transceivers, the controller being in communications with each of the plurality of transceivers via a controller transceiver, the controller communicating via preformatted messages;	"This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, p. 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22.
wherein the preformatted messages comprises at least one packet, wherein the packet comprises:	*"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header.
a receiver address comprising a scalable address of the at least one of the intended receiving transceivers;	*"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and

	fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or

	destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information

	is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59.

	'252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
sender address comprising the unique address of the sending transceiver;	*"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the

	destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
a command indicator comprising a command code;	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below.

	For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60.

	"During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet

	network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
at least one data value comprising a scalable message; and	"Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B). … Forwarding is accomplished via information read from the device and tier tables (Sections III-B and III-C) and from the packet headers (Section IV-A). Forward error correction increases the probability of error-free reception, and cyclic redundancy checksums prevent, with high probability, the forwarding of packets that are not error-free (Section IV-C)." Jubin page 25.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to

	eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and

	"network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields.

	Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector comprising a redundancy check error detector; and	"Forward error correction increases the probability of error-free reception, and cyclic redundancy checksums prevent, with high probability, the forwarding of packets that are not error-free (Section IV-C)." Jubin page 25. "*C. Error Control* *Forward Error Correction*: The LPR uses long convolutional codes and sequential decoding to perform forward error correction (FEC)… *Cyclic Redundancy Checksum*: The LPR also has hardware to generate a 32-bit cyclic redundancy checksum (CRC)." Jubin page 27.
wherein the controller sends preformatted command messages via the controller transceiver, and the plurality of transceivers send preformatted response messages.	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23.

	"Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
2. The system of claim 1, wherein the plurality of transceivers further comprise at least one integrated transceiver, wherein the integrated transceiver comprises:	The above contentions for claim 1 are hereby incorporated by reference.
one of the plurality of transceivers; and	"A unique feature of the PRNET is the ease with which network topology can be altered without affecting the user's ability to communicate. Although RF connectivity is difficult to predict and may abruptly change in unexpected ways as mobile packet radios move about, the automated network management procedures used in the PRNET are capable of sensing the existing connectivity in order to continuously transport data and control packets, all in a way that is totally transparent to the users." Jubin page 22. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
a sensor detecting a condition and outputting a sensed data signal to the transceiver.	"A unique feature of the PRNET is the ease with which network topology can be altered without affecting the user's ability to

	communicate. Although RF connectivity is difficult to predict and may abruptly change in unexpected ways as mobile packet radios move about, the automated network management procedures used in the PRNET are capable of sensing the existing connectivity in order to continuously transport data and control packets, all in a way that is totally transparent to the users." Jubin page 22. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
3. The system of claim 2, wherein the at least one integrated transceiver receives the preformatted command message requesting sensed data, confirms the receiver address as its own unique address, receives the sensed data signal, formats the sensed data signal into scalable byte segments, determines a number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet, wherein the packets are equal to the number of segments.	The above contentions for claim 2 are hereby incorporated by reference. "A unique feature of the PRNET is the ease with which network topology can be altered without affecting the user's ability to communicate. Although RF connectivity is difficult to predict and may abruptly change in unexpected ways as mobile packet radios move about, the automated network management procedures used in the PRNET are capable of sensing the existing connectivity in order to continuously transport data and control packets, all in a way that is totally transparent to the users." Jubin page 22. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR

	continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23. "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and

	receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network

	service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Jubin

	Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
10. The system of claim 1, wherein the plurality of transceivers further comprise at least one actuated transceiver, wherein the actuated transceiver comprises:	The above contentions for claim 1 are hereby incorporated by reference.
one of the plurality of transceivers;	"PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc. – are available for local debugging." Jubin page 23. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
a sensor detecting a second condition and outputting a sensed data signal to the transceiver; and	"Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
an actuator controlling a third condition and receiving control signals from the transceiver.	"*Adaptive Power Control*: The hardware provides the software the capability to select, on a packet-by-packet basis, attenuation to the nominal 5-W transmitted signal of 0 to 24 dB in 8-dB steps. This feature can be used to decrease or increase network connectivity or to match the signal power of transmission from various-distanced PRs at each receiver, to mitigate the "near-far" problem." Jubin page 31.
17. A system for communicating commands and sensed data	"The PRNET provides, via a common radio channel, the

between remote devices, the system comprising:	exchange of data between computers that are geographically separated." Jubin page 21.
a plurality of transceivers, each transceiver being in communication with at least one other of the plurality of transceivers, wherein each transceiver has a unique address, wherein the unique address identities an individual transceiver, wherein each transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with the other transceivers via preformatted messages;	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, page 22. "This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. Jubin page 22 and 25. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B). Jubin page 25.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Jubin

	"*ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
a controller, connected to one of the plurality of transceivers, the controller being in communications with each of the plurality of transceivers via a controller transceiver, the controller communicating via preformatted messages, wherein the preformatted messages comprises at least one packet, wherein the packet comprises:	"This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22.
a receiver address comprising a scalable address of the at least one of the intended receiving transceivers;	"*A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-

	B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25.

	"The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A

	tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing:

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Jubin

	Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
sender address comprising the unique address of the sending transceiver;	"*ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
a command indicator comprising a command code;	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging."

	Jubin page 23. "PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
at least one data value comprising a scalable message; and	"Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B). … Forwarding is accomplished via information read from the device and tier tables (Sections III-B and III-C) and from the packet headers (Section IV-A). Forward error correction increases the probability of error-free reception, and cyclic redundancy checksums prevent, with high probability, the forwarding of packets that are not error-free (Section IV-C)." Jubin page 25. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson:

	"FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in

	several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual

	address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more

Exhibit P2 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Jubin

	commercialized and proposing extensions for IP addressing.
an error detector comprising a redundancy check error detector;	"Forward error correction increases the probability of error-free reception, and cyclic redundancy checksums prevent, with high probability, the forwarding of packets that are not error-free (Section IV-C)." Jubin page 25. "*C. Error Control* *Forward Error Correction*: The LPR uses long convolutional codes and sequential decoding to perform forward error correction (FEC)… *Cyclic Redundancy Checksum*: The LPR also has hardware to generate a 32-bit cyclic redundancy checksum (CRC)." Jubin page 27.
wherein the controller sends preformatted command messages via the controller transceiver, and the plurality of transceivers send preformatted response messages; and	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
wherein at least one of the plurality of transceivers further sends	To the extent that Plaintiffs contend that this claim limitation is

preformatted emergency messages.	not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation. For example, U.S. Patent No. 5,907,491 discloses that "[w]hile it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28. U.S. Patent No. 6,366,217, discloses that "[t]he information signal contains the data collected by the sensor interface module, or the emergency code." '217 patent, 13:66-14:1. U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.

18. The system of claim 17, wherein the controller maintains periods of silence by not sending the preformatted command messages during predetermined time periods; and	The above contentions for claim 17 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation. For example, U.S. Patent No. 5,907,491 discloses that "[w]hile it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28. U.S. Patent No. 6,366,217, discloses that "[t]he information signal contains the data collected by the sensor interface module, or the emergency code." '217 patent, 13:66-14:1.

	U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
wherein the at least one of the plurality of transceivers detects a period of silence and sends the preformatted emergency message during the period of silence.	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation. For example, U.S. Patent No. 5,907,491 discloses that "[w]hile it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28. U.S. Patent No. 6,366,217, discloses that "[t]he information signal contains the data collected by the sensor interface module, or the emergency code." '217 patent, 13:66-14:1.

	U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
37. A method of communicating between geographically remote devices, the method comprising:	"The PRNET system comprises: • The PRNET subnet, which consists of the packet radios. The PRNET subnet provides the means of interconnecting a community of users. • The collection of devices (host computers and terminals), each attached to a packet radio via a wire high-level data link control (HDLC) interface, that wish to exchange data in real time." Jubin, page 22. "This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. Jubin pages 22 and 25.

	"Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B)." Jubin page 25. *"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
sending a message;	"Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. Jubin pages 22 and 25.
receiving the message at one or more of the remote devices;	"Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. Figs. 2 and 6. Jubin pages 22 and 25. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23.

	"PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23. "Forwarding: Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's headers and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second, to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26.
processing the message;	"This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e.,

	host computer or terminal) via the wireless interface." Jubin page 22. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B). … Forwarding is accomplished via information read from the device and tier tables (Sections III-B and III-C) and from the packet headers (Section IV-A)." Jubin page 25. "Forwarding: Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's headers and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second, to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor

	will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
preparing a response message;	"This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B). … Forwarding is accomplished via information read from the device and tier tables (Sections III-B and III-C) and from the packet headers (Section IV-A)." Jubin page 25. "Forwarding: Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's headers and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second, to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26.

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
receiving the response message;	"This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute

	jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23. "Forwarding: Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's headers and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second, to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26.
processing the response message	"This packet radio equipment has been designated the Low-cost Packet Radio (LPR) [5], Fig. 1. The LPR consists of both digital and RF subsystems." Jubin, page 22. "The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer

	to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B). … Forwarding is accomplished via information read from the device and tier tables (Sections III-B and III-C) and from the packet headers (Section IV-A)." Jubin page 25. "Forwarding: Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's headers and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second, to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23. "Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR

	continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23.
wherein all messages comprise at least one packet, the packet having a predetermined format;	"A.Packet Headers Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. … The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header." Jubin page 25.
wherein the predetermined format comprises:	
a receiver address comprising a scalable address of the at least one of the intended receiving remote devices;	*"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding

	through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service

	module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39.

	"FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to

	addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a sender address comprising an unique address of the sender;	*"ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is used to update the PR's stored-device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B)." Jubin page 25.
a command indicator comprising a command code;	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. "PRs can also be loaded and debugged from a remote host computer. All commands available to a local operator are available to a remote operator." Jubin page 23.

	"Another host computer function called the Network Monitor is used to aid in observing and analyzing the PRNET. Each PR continuously gathers measurements on bidirectional link quality, nodal capacity, and route characteristics. The Network Monitor will collect data from each of the packet radios and display them graphically to aid the network designers in characterizing and understanding the network behavior." Jubin page 23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Burchfiel, which is also directed to the PRNET, discloses:

	"The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent

	week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses:

	"Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a scalable data value comprising a scalable message; and	"Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B). … Forwarding is accomplished via information read from the device and tier tables (Sections III-B and III-C) and from the packet headers (Section IV-A). Forward error correction increases the probability of error-free reception, and cyclic redundancy checksums prevent, with high probability, the forwarding of packets that are not error-free (Section IV-C)." Jubin page 25. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Jubin, it would have been obvious to a person ordinary skill in the art to combine and/or modify Jubin with the teachings of one or more of the additional references teaching this limitation as cited below. U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the

	length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the

	information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet."

	'252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector that is a redundancy check error detector; and	"Forward error correction increases the probability of error-free

	reception, and cyclic redundancy checksums prevent, with high probability, the forwarding of packets that are not error-free (Section IV-C)." Jubin page 25.
wherein the steps of sending and receiving are repeated until the message is received by the intended receiver.	"The digital subsystem controls the routing and flow of packets between PRs while the RF subsystem transmits and receives packets over the radio channel. … Each PR is responsible for receiving a packet and relaying it on to a PR that is one hop closer to the final destination. The packets can be routed either to another PR over the radio channel or to an attached device (i.e., host computer or terminal) via the wireless interface." Jubin page 22. "Instead, generally speaking, a packet traverses a single path through the network, and is acknowledged at every packet radio along the path (Section IV-B). … Forwarding is accomplished via information read from the device and tier tables (Sections III-B and III-C) and from the packet headers (Section IV-A)." Jubin page 25. "Forwarding: Packets are forwarded over a single path through the PRNET by each packet radio using the information in the packet's headers and in its own device and tier tables. Each PR uses this information, first, to decide whether it should be the one to transmit the packet on, second, to update the routing header before transmitting the packet on, and third, to update its own tables." Jubin page 26. Retransmission: If a PR, say L, that has forwarded a packet does not receive an acknowledgement within a certain interval, it retransmits the packet." Jubin page 26.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 7,697,492 based on Burchfiel

The '492 Patent – Claim	J. Burchfiel et al., *"Functions and structure of a packet radio station,"* National Computer Conference, 1975.
1. In a communication system to communicate command and sensed data between remote devices, the system comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a receiver address comprising a scalable address of at least one remote device;	"Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247. "The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the program which deals with control at level M does not see control information at levels less than M; it is inserted by lower level programs on transmission, and stripped doff by lower level programs on reception. Figure 3 shows this layering explicitly…." Burchfiel page 246. Figure 3, Burchfiel page 247. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 7,697,492 based on Burchfiel

	For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson:

	"FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in

	several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual

	address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more

	commercialized and proposing extensions for IP addressing.
a command indicator comprising command code;	"The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted,

	if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through

	appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2.

	U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a data value comprising a scalable message; and	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error message to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers,

	which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the

	length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the

	information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet."

	'252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a controller associated with a remote device comprising a	"The set of functions which appear in common in a station,

transceiver configured to send and receive wireless signals, the remote device configured to send a preformatted message comprising the receiver address, a command indicator, and the data value via the transceiver to at least one other remote device.	repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is providing in its IMP-16 microprocessor." Burchfiel page 245. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. "Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 "Radio Hop" protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figs. 2 and 3, Burchfiel pages 246-247. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or

	deposit words in the PRU's microprocessor memory, and the RU responds with a positive acknowledgement for each command." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command

	or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data,

	functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
2. The system of claim 1, further comprising:	The above contentions for claim 1 are hereby incorporated by reference.
a plurality of transceivers each having a unique address, the transceiver being one of the plurality of transceivers;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. "Each PRU (station, repeater, terminal) has a unique, hardwired I.D." Burchfiel page 247.
a plurality of controllers associated with each the controller associated with at least one of the transceivers, the controller being in communication with at least one other transceiver with a preformatted message, the preformatted message having at least one scalable field;	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the station providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is provided in its IMP-16 microprocessor." Burchfiel page 245. "The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the program which deals with control at level M does not see control information at levels less than M; it is inserted by lower level programs on transmission, and stripped doff by lower level programs on reception. Figure 3 shows this layering explicitly…." Burchfiel page 246. Figure 3, Burchfiel page 247. To the extent that Plaintiffs contend that this claim limitation is

	not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26.

	In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module

	sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing

	performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network

	numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
at least one sensor associated with at least one of the transceivers to detect a condition and output a data signal to the transceiver; and	"When any repeater detects a significant routing event, e.g., failure of some previously established route or a request from a terminal to enter a network, the repeater forwards this information over its control connection to the nearest station." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's." Burchfiel page 250.
at least one actuator associated with at least one of the transceivers to activate a device.	"The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends command over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250.
3. The system of claim 1, wherein the controller sends the preformatted message via an associated transceiver, and at least	The above contentions for claim 1 are hereby incorporated by reference.

one transceiver sends the preformatted response message.	"The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends command over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250.
4. The system of claim 1, wherein at least one transceiver receives the preformatted message requesting sensed data, confirms the receiver address as its own unique address, receives a sensed data signal, formats the sensed data signal into scalable byte segments, determines the number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet.	The above contentions for claim 1 are hereby incorporated by reference. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends command over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. "The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the program which deals with

	control at level M does not see control information at levels less than M; it is inserted by lower level programs on transmission, and stripped doff by lower level programs on reception. Figure 3 shows this layering explicitly….” Burchfiel page 246. Figure 3, Burchfiel page 247. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *“A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs’ stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header.” Jubin page 25 (see Table for

	routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service

	module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39.

	"FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to

	addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
6. The system of claim 1, wherein each remote device is adapted to transmit and receive radio frequency transmissions to and from at least one other transceiver.	The above contentions for claim 1 are hereby incorporated by reference. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "STATION CONTROL FUNCTIONS The control functions performed by a station include initialization of the PRN, dynamic routing changes, and multi-station coordination. Initialization of the PRN includes the following

	steps: 1. Measurement of RF propagation connectivity between all stations and repeaters." Burchfiel page 247.
8. A method of communicating command and sensed data between remote wireless devices, the method comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
providing a receiver to receive at least one message;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio. It will serve standalone as a repeater; addition of the station interface hardware and software option converts it to a station; addition of the terminal interface hardware and software option converts it to a terminal." Burchfiel page 246. Figure 1, Burchfiel page 247.
wherein the message has a packet comprising a command indicator comprising a command code, a scalable data value comprising a scalable message, and an error detector that is a redundancy check error detector; and	"Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between the source process and destination process, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "They also require error control because of message interference

	in the shared broadcast communication channel. The error control mechanisms selected are: 1.A sequence number in each packet to permit detection of missing or duplicative packets. 2.An end-to-end positive acknowledgement for packets which arrive successfully. 3.A source timeout which causes periodic retransmission of unacknowledged packets." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. "Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 "Radio Hop" protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figs. 2 and 3, Burchfiel page 246-247. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot)."

	Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute

	jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data

	transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information

	originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson:

	"FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in

	several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual

	address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more

	commercialized and proposing extensions for IP addressing.
providing a controller to determine if at least one received message is a duplicate message and determining a location from which the duplicate message originated.	"Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between the source process and destination process, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is providing in its IMP-16 microprocessor." Burchfiel page 245. "One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination. Such connections require flow control to prevent a source from overloading the network and causing serious congestion. They also require error control because of message interference in the shared broadcast communication channel." Burchfiel page 246. "All labeled repeaters that hear a search packet on the first hop forward it via their established route to every station that had labeled the receiving repeater. All unlabeled repeaters ignore search packets." Burchfiel page 247. "They also require error control because of message interference in the shared broadcast communication channel. The error control mechanisms selected are:

	1.A sequence number in each packet to permit detection of missing or duplicative packets. 2.An end-to-end positive acknowledgement for packets which arrive successfully. 3.A source timeout which causes periodic retransmission of unacknowledged packets." Burchfiel page 246.
9. The method of claim 8, further comprising providing at least one remote wireless communication device, wherein at least one of the devices comprise geographically remote transceivers adapted to transmit and receive at least one message using radio frequency transmissions.	The above contentions for claim 8 are hereby incorporated by reference. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245 "Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between the source process and destination process, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246.

	"STATION CONTROL FUNCTIONS The control functions performed by a station include initialization of the PRN, dynamic routing changes, and multi-station coordination. Initialization of the PRN includes the following steps: 1. Measurement of RF propagation connectivity between all stations and repeaters." Burchfiel page 247.
10. The method of claim 8, further comprising providing at least one remote wireless communication device, wherein at least one of the devices has a unique address and the packet further comprises at least one scalable address field to contain the unique address for at least one device.	The above contentions for claim 8 are hereby incorporated by reference. "Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers

	that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and

	receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network

	service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for

	Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
11. The method of claim 8, further comprising providing an actuator associated with at least one of the remote devices, the actuator configured to actuate in response to the command code.	The above contentions for claim 8 are hereby incorporated by reference. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the

	station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot)." Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends command over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger. " Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses:

	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be

	programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater

	functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
13. The method of claim 8, further comprising determining if an error exists in a packet of the at least one message.	The above contentions for claim 8 are hereby incorporated by reference. "They also require error control because of message interference in the shared broadcast communication channel. The error control mechanisms selected are: 1.A sequence number in each packet to permit detection of missing or duplicative packets. 2.An end-to-end positive acknowledgement for packets which arrive successfully. 3.A source timeout which causes periodic retransmission of unacknowledged packets." Burchfiel page 246.
14. A wireless communication device for use in a communication system to communicate command and sensed data between	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of

remote wireless communication devices, the wireless communication device comprising:	information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a transceiver configured to send and receive wireless communications; and	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio. It will serve standalone as a repeater; addition of the station interface hardware and software option converts it to a station; addition of the terminal interface hardware and software option converts it to a terminal." Burchfiel page 246.
a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to format a message comprising a receiver address comprising a scalable address of at least one remote wireless device; a command indicator comprising a command code, a data value comprising a scalable message.	"Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between the source process and destination process, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is providing in its IMP-16 microprocessor." Burchfiel page 245. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each

	direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. "Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 "Radio Hop" protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figures 2 and 3, Burchfiel pages 246-247. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted,

	if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for

	routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses:

	"Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed

	through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to

	individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message

	includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space.

	Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
15. The wireless communication device of claim 14, further comprising at least one sensor configured to detect a condition and output a signal to the controller.	The above contentions for claim 14 are hereby incorporated by reference. "When any repeater detects a significant routing event, e.g., failure of some previously established route or a request from a terminal to enter a network, the repeater forwards this information over its control connection to the nearest station." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's." Burchfiel page 250.
16. The wireless communication device of claim 14, wherein the controller is further configured to determine if at least one	The above contentions for claim 14 are hereby incorporated by reference.

received message is a duplicate message and determine a location from which the duplicate message originated.	"Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between the source process and destination process, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is providing in its IMP-16 microprocessor." Burchfiel page 245. "One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination. Such connections require flow control to prevent a source from overloading the network and causing serious congestion. They also require error control because of message interference in the shared broadcast communication channel." Burchfiel page 246. "All labeled repeaters that hear a search packet on the first hop forward it via their established route to every station that had labeled the receiving repeater. All unlabeled repeaters ignore search packets." Burchfiel page 247. "They also require error control because of message interference in the shared broadcast communication channel. The error control mechanisms selected are: 1.A sequence number in each packet to permit detection of

	missing or duplicative packets. 2.An end-to-end positive acknowledgement for packets which arrive successfully. 3.A source timeout which causes periodic retransmission of unacknowledged packets." Burchfiel page 246.
17. The wireless communication device of claim 14, further comprising at least one actuator configured to implement an action corresponding to the command code.	The above contentions for claim 14 are hereby incorporated by reference. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot)." Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends command over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger. " Burchfiel page 250.
18. The device of claim 14, wherein the transceiver comprises a unique transceiver address to distinguish the transceiver from other transceivers.	The above contentions for claim 14 are hereby incorporated by reference.

Exhibit P2 – Invalidity Chart for U.S. Patent No. 7,697,492 based on Burchfiel

	"Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247.
19. In a system for communicating commands and sensed data between remote devices comprising a communications device for communicating commands and sensed data, the communications device comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a transceiver operably configured to be in communication with at least one other of a plurality of transceivers, wherein the transceiver has a unique address, wherein the unique address identities the individual transceiver, wherein the transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with each of the other transceivers via preformatted messages;	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing a store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio. It will serve standalone as a repeater; addition of the station interface hardware and software option converts it to a station; addition of the terminal interface hardware and software option converts it to a terminal." Burchfiel page 246. "Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247.

	"Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. "Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 "Radio Hop" protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figures 2 and 3, Burchfiel pages 246-247.
a controller configured to be in communication with the transceiver, the controller configured to provide preformatted messages for communication;	"Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between the source process and destination process, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is providing in its IMP-16 microprocessor." Burchfiel page 245.
wherein the preformatted message comprises at least one packet,	"Reliable data transmission between PRN data sources and sinks

wherein the packet comprises: a receiver address comprising a scalable address of the at least one of the intended receiving transceivers; sender address comprising the unique address of the sending transceiver; a command indicator comprising a command code; at least one data value comprising a scalable message; and an error detector comprising a redundancy check error detector; and wherein the controller is configured to interact with the transceiver to send preformatted command messages.	is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between the source process and destination process, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is providing in its IMP-16 microprocessor." Burchfiel page 245. "They also require error control because of message interference in the shared broadcast communication channel. The error control mechanisms selected are: 1.A sequence number in each packet to permit detection of missing or duplicative packets. 2.An end-to-end positive acknowledgement for packets which arrive successfully. 3.A source timeout which causes periodic retransmission of unacknowledged packets." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. "Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1

	routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 "Radio Hop" protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figs. 2 and 3, Burchfiel page 246-247. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot)." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in

	the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR,

	encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity."

Exhibit P2 – Invalidity Chart for U.S. Patent No. 7,697,492 based on Burchfiel

	U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection

	bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class

	address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message

	format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space.

	Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
20. The communication device of claim 19, further comprising a sensor operatively configured to detect a condition and output a sensed data signal that corresponds to the condition to the transceiver.	The above contentions for claim 19 are hereby incorporated by reference. "When any repeater detects a significant routing event, e.g., failure of some previously established route or a request from a terminal to enter a network, the repeater forwards this information over its control connection to the nearest station." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's." Burchfiel page 250.
21. The communication device of claim 20, wherein the	The above contentions for claim 20 are hereby incorporated by

transceiver is configured to receive a preformatted command message requesting sensed data, confirms the receiver address is its own unique address, receives the sensed data signal, formats the sensed data signal into scalable byte segments, determines a number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet.	reference. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends command over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. "The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the program which deals with control at level M does not see control information at levels less than M; it is inserted by lower level programs on transmission, and stripped doff by lower level programs on reception. Figure 3 shows this layering explicitly…." Burchfiel page 246. Figure 3, Burchfiel page 247. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491

	(“the ‘491 patent”), U.S. Patent No. 7,027,773 (“the ‘773 patent”), U.S. Patent No. 6,100,817 (“the ‘817 patent”), U.S. Patent No. 5,874,903 (“the ‘903 patent”) or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: “From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated.” Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: “PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator.” Jubin page 23. “A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging.” Jubin page 23. *“A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and

	fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the

	command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS

	message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43.

	'252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network

	service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP

	addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
25. A wireless communication device for use in a communication system to communicate a number of commands and sensed data between remote wireless communication devices, the wireless communication device comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing a store-and-forward function on the radio broadcast channel." Burchfiel

	page 245.
a transceiver configured to send and receive wireless communications; and	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a packet radio unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio. It will serve standalone as a repeater; addition of the station interface hardware and software option converts it to a station; addition of the terminal interface hardware and software option converts it to a terminal. The additional functions shown for terminal may either be implemented in a separate microprocessor or provided in a separate memory partition within the terminal's PRU, timesharing its microprocessor for economy." Burchfiel page 245-246. Figure 1, Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure." Burchfiel page 246.
a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to reformat a message comprising receiver address comprising a scalable address of at least one remote wireless device; a command indicator comprising a command code; a data value comprising a scalable	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-

message.	forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is providing in its IMP-16 microprocessor." Burchfiel page 245. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. "Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 "Radio Hop" protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figs. 2 and 3, Burchfiel pages 246-247. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the RU responds with a positive acknowledgement for each command." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is

	not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23.

	"A.Packet Headers Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by

	monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be

	used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the

	length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the

	information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet."

	'252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.

The '611 Patent – Claim	J. Burchfiel et al., *"Functions and structure of a packet radio station,"* National Computer Conference, 1975.
1. A system for remote data collection, assembly, storage, and event detection and reporting, comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and performs translation of format effector characters as needed." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. "Our prototype station has the additional station functions

	implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246.
a plurality of transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "The protocols of the Packet Radio Network are layered or hierarchical. … Figure 3 shows this layering explicitly…." Burchfiel page 246. Figure 3, Burchfiel page 247. "A level-3 debugging protocol has been defined which supports

	debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN.	"Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246. "For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. " Burchfiel page 249. Figure 4, Burchfiel page 249.
5. A system for monitoring remote devices, comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel

	page 245.
at least one sensor adapted to generate an electrical signal in response to a physical condition;	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245.
at least one wireless transmitter electrically interfaced with the sensor and configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a radio-frequency (RF) signal;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
one or more additional wireless transmitters each electrically	"A packet radio network is a digital broadcast channel, fixed and

interfaced with a sensor and configured to receive the RF signal and retransmit the RF signal;	mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245.
at least one gateway connected a wide area network (WAN) configured to receive and translate the retransmitted RF signal, the gateway further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN; and	"Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246. "For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. " Burchfiel page 249. Figure 4, Burchfiel page 249.
a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and

located device.	control connections).” Burchfiel page 245. “In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and performs translation of format effector characters as needed.” Burchfiel page 245. “The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1.” Burchfiel page 245. “The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio.” Burchfiel page 245. “Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET.” Burchfiel page 246. Figure 1, Burchfiel page 246.
6. The system of claim 5, wherein the at least one gateway is permanently connected to the WAN.	The above contentions for claim 5 are hereby incorporated by reference. “Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET.” Burchfiel page 246.

8. The system of claim 5, wherein the gateway translates the encoded electrical signal, the transmitter identification and the transceiver identification information into TCP/IP for communication over the WAN.	The above contentions for claim 5 are hereby incorporated by reference. "Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. "For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. " Burchfiel page 249. Figure 4, Burchfiel page 249.
9. A system for controlling a remote device comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a target remote device having an actuator to be controlled;	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some

	anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot)." Burchfiel page 250. "The debug program is another independent process. On request fro the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S.

	Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60.

	"During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19.

	U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a computer configured to execute at least one computer program that generates at least one control signal responsive to a system input signal; said computer integrated with a wide area network (WAN);	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and performs translation of format effector characters as needed." Burchfiel page 245. "The programs which provide centralized monitoring, debugging,

	and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. "Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246.
a gateway connected to the WAN configured to receive and translate the at least one control signal	"Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246. "For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. " Burchfiel page 249. Figure 4, Burchfiel page 249.
a wireless transmitter coupled with the gateway for transmitting a	"A packet radio network is a digital broadcast channel, fixed and

wireless signal that contains the control signal;	mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. "Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246.
a first wireless transceiver electrically interfaced with an actuator for receiving the wireless signal and further retransmitting the wireless signal to the target remote device; and	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-

	forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246.
logic coupled to the target remote device for extracting the control signal from the retransmitted wireless signal and imparting an action on the actuator in response to the extracted control signal.	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and performs translation of format effector characters as needed." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245. Figure 1, Burchfiel page 246. "The additional functions shown for terminal may either be implemented in a separate microprocessor or provided in a separate memory partition within the terminal's PRU, timesharing its microprocessor for economy." Burchfiel page 246.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging."

	Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51.

	U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

10. The system of claim 9, further comprising:	The above contentions for claim 9 are hereby incorporated by reference.
a plurality of additional wireless transceivers each coupled to an actuator and configured to receive the wireless signal and to retransmit the wireless signal, wherein one of the plurality of additional wireless transceivers receive the wireless signal from the wireless transmitter and another one of the plurality of the additional wireless transceivers retransmits the wireless signal to the first wireless transceiver.	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system

	programmer." Burchfiel page 248. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot)." Burchfiel page 250. "The debug program is another independent process. On request fro the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions." Burchfiel page 250.
11. The system of claim 9, further comprising:	The above contentions for claim 9 are hereby incorporated by reference.
a plurality of additional wireless transceivers each coupled to an actuator or a sensor and configured to receive the wireless signal and to retransmit the wireless signal, wherein one of the plurality of additional wireless transceivers receive the wireless signal from the wireless transmitter and another one of the plurality of the additional wireless transceivers retransmits the wireless signal to the first wireless transceiver.	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations

	providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot)." Burchfiel page 250. "The debug program is another independent process. On request fro the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions." Burchfiel page 250.

12. A system for remote data collection, assembly, storage, and event detection and reporting, comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and performs translation of format effector characters as needed." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. "Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246.

	Figure 1, Burchfiel page 246.
a plurality of non-earth orbiting transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.

at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN.	"Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246. "For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. " Burchfiel page 249. Figure 4, Burchfiel page 249.
14. The system as defined claim 12, wherein the gateway translates the encoded electrical signal, the transmitter identification, and the transceiver identification information into TCP/IP for communication over the WAN.	The above contentions for claim 12 are hereby incorporated by reference. "Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. "For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. " Burchfiel page 249.

	Figure 4, Burchfiel page 249.

Exhibit P3 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Burchfiel

The '692 Patent – Claim	J. Burchfiel et al., *"Functions and structure of a packet radio station,"* National Computer Conference, 1975.
1. A system for remote data collection, assembly, and storage comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and performs translation of format effector characters as needed." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. "Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246.

	Figure 1, Burchfiel page 246.
at least one wireless transmitter configured to transmit select information and transmitter identification information;	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
a plurality of relatively low-power radio-frequency (RF) transceivers dispersed geographically at defined locations configured to receive select information transmitted from at least one nearby wireless transmitter and further configured to transmit the select information, the transmitter identification information and transceiver identification information; and	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245.

	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
at least one gateway connected to the wide area network configured to receive and translate the select information, the transmitter identification information, and transceiver identification information, said gateway further configured to farther transmit the translated information to the computer over the WAN.	"Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246. "For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. " Burchfiel page 249. Figure 4, Burchfiel page 249.
3. The system as defined in claim 1, wherein each wireless transmitter is configured to transmit a relatively low-power, radio-frequency (RF) signal.	The above contentions for claim 1 are hereby incorporated by reference. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245.

	Figure 1, Burchfiel page 246. Figure 4, Burchfiel page 249.
4. The system as defined in claim 1, wherein each wireless transmitter is integrated with a sensor.	The above contentions for claim 1 are hereby incorporated by reference. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establishes control connections to the PRU's of the newly-discovered device." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's." Burchfiel page 250.
5. The system as defined in claim 1, wherein the RF signal transmitted by the receiver contains a concatenation of information comprising select information and transmitter identification information from the originating transmitter and transceiver identification information for each transceiver that receives and repeats the RF signal.	The above contentions for claim 1 are hereby incorporated by reference. "The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the programs which deals with control at level M does not see control information at levels less than M; it is inserted by lower level programs on transmission, and stripped off by lower level programs on reception. Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which

	controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 'Radio Hop' protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figure 3, Burchfiel page 247. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
6. The system as defined in claim 5, wherein the at least one transmitter is replaced by a transceiver, the transceiver further integrated with an actuator.	The above contentions for claim 5 are hereby incorporated by reference. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250.
7. The system as defined in claim 6, wherein the transceivers are configured to communicate with the gateway via a RF signal.	The above contentions for claim 6 are hereby incorporated by reference. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has

	been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. Figure 4, Burchfiel page 249.
8. The system as defined in claim 7, wherein the computer is further configured to respond to received select information by communicating a control signal to at least one transceiver, wherein the actuator integrated with the transceiver is responsive to the control signal.	The above contentions for claim 7 are hereby incorporated by reference. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's." Burchfiel page 250.
11. The system as defined in claim 1, wherein the gateway includes one selected from the group consisting of:	The above contentions for claim 1 are hereby incorporated by reference.
a modem for establishing a dial-up connection with a remote computer; a network card for communicating across a local area network; a network card for communicating across the WAN, a DSL modem; and an ISDN card to permit backup access to the computer.	"Figure 4 shows the hardware organization of our prototype station: it is a PDP-11 processor interfaced to a packet radio unit. In the initial tests, it will also be connected as a gateway to the ARPANET." Burchfiel page 249. Figure 4, Burchfiel page 249.

12. The system as defined in claim 1, wherein the gateway translates the select information, the transmitter identification, and the transceiver identification information to TCP/IP for communication over the WAN.	The above contentions for claim 1 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example:

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed

	over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
13. The system as defined in claim 1, wherein the WAN is the Internet.	The above contentions for claim 1 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways:

	1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2.The second approach will be conversion between the host-host protocols of the two networks.…" Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.
14. The system as defined in claim 1, wherein the WAN is a dedicated Intranet.	The above contentions for claim 1 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "This applies not only to host-host protocol, but also to higher level protocols such as TELNET, file transfer, and remote job entry. All that is required is a conversion program for the high-level protocol of interest, interposed between the PRN connection and the ARPANET connection." Burchfiel page 249.
24. A method for controlling a system comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital

	terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
remotely collecting data from at least one sensor;	"The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's." Burchfiel page 250.
processing the data into a radio-frequency (RF) signal;	"One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. Figure 4, Burchfiel page 249.
transmitting the RF signal, via a relatively low-power transceiver, to a gateway;	Figure 1, Burchfiel page 246. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It

	sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establishes control connections to the PRU's of the newly-discovered devices. This procedure is iterated until every station and repeater in the area has been configured into the network. At this point, the control process has an open control connection to every other station and repeater in the PRN." Burchfiel page 250.
translating the data in the RF signal into a network transfer protocol;	"Figure 4 shows the hardware organization of our prototype station: it is a PDP-11 processor interfaced to a packet radio unit. In the initial tests, it will also be connected as a gateway to the ARPANET." Burchfiel page 249. Figure 4, Burchfiel page 249. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2.The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol

	and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.
sending the translated data to a computer, wherein the computer is configured to appropriately respond to the data generated by the at least one sensor by generating an appropriate control signal;	"The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250.
sending the control signal via the network to the gateway,	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory,

	and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250.
translating the control signal from a network transfer protocol into an RF control signal;	"Figure 4 shows the hardware organization of our prototype station: it is a PDP-11 processor interfaced to a packet radio unit. In the initial tests, it will also be connected as a gateway to the ARPANET." Burchfiel page 249. Figure 4, Burchfiel page 249.
transmitting the RF control signal;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246.
receiving the RF control signal;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246.

	"One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246.
translating the received RF control signal into an analog signal; and	"The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250.
applying the analog signal to an actuator to effect the desired system response.	"The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250.
25. The method of claim 24, wherein the RF signal contains a concatenation of information comprising encoded data information and transmitter identification information from an originating transmitter.	The previous contentions for claim 24 are herby incorporated by reference. "The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the programs which deals with control at level M does not see control information at levels less than M; it is inserted by lower level programs on transmission, and

	stripped off by lower level programs on reception. Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 'Radio Hop' protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figure 3, Burchfiel page 247. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
26. The method of claim 25, wherein the step of transmitting the RF signal is further performed by at least one transceiver, wherein the transceiver is configured to concatenate a transceiver identification code to the RF signal.	The previous contentions for claim 25 are herby incorporated by reference. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is

	programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
27. The method of claim 25, wherein the step of transmitting the RF control signal is further performed by at least one transceiver, wherein the transceiver is configured to receive and transmit the RF control signal.	The previous contentions for claim 25 are herby incorporated by reference. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246.

Exhibit P3 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Burchfiel

28. The method of claim 25, wherein the steps of translating and applying the received RF control signal are performed only by an identified transceiver electrically integrated with an actuator.	The previous contentions for claim 25 are herby incorporated by reference. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250.
29. The method of claim 25, wherein the network is the Internet.	The above contentions for claim 25 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2.The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway

	function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.
30. The method of claim 25, wherein the network is an Intranet.	The above contentions for claim 25 are hereby incorporated by reference. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2.The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 1, Burchfiel page 246. "This applies not only to host-host protocol, but also to higher level protocols such as TELNET, file transfer, and remote job entry. All that is required is a conversion program for the high-level protocol of interest, interposed between the PRN connection and the ARPANET connection." Burchfiel page 249.
31. The method of claim 25, wherein the network transfer protocol is TCP/IP.	The above contentions for claim 25 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections

	between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2.The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: “The PRNET can also be accessed from other networks via an Internet gateway.” Jubin page 23.

	'217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses:

	"Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
32. A system for monitoring remote devices comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
at least one sensor adapted to generate an electrical signal in response to a physical condition;	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.

at least one wireless transmitter configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a low-power radio-frequency (RF) signal;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246. "A level-3 debugging protocol has been defined which supports debugging of

	remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
at least one gateway connected a wide area network (WAN) configured to receive and translate the RF signal, the gateway further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN; and	"Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246. "For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. " Burchfiel page 249. Figure 4, Burchfiel page 249.
a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and

	performs translation of format effector characters as needed." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. "Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246.
34. The system defined in claim 32, wherein each wireless transmitter is configured to transmit a relatively low-power radio-frequency (RF) signal.	The above contentions for claim 32 are hereby incorporated by reference. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. Figure 4, Burchfiel page 249.
36. The system defined in claim 32, wherein the	The above contentions for claim 32 are hereby incorporated by reference.

gateway translates the encoded electrical signal, the transmitter identification, and the transceiver identification information into TCP/IP for communicating over the WAN.	Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 3. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 4. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example:

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44.

	"For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
37. The system defined in claim 32, wherein the WAN in the Internet.	The above contentions for claim 32 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol

	mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2.The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: “The PRNET can also be accessed from other networks via an Internet gateway.” Jubin page 23. ‘217 patent discloses: “The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal

	will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in

	the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
38. The system defined in claim 32, wherein the WAN is a dedicated Intranet.	The above contentions for claim 32 are hereby incorporated by reference. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2.The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 1, Burchfiel page 246. "This applies not only to host-host protocol, but also to higher level protocols such as TELNET, file transfer, and remote job entry. All that is required is a conversion program for the high-level protocol of interest, interposed between

	the PRN connection and the ARPANET connection." Burchfiel page 249.
42. A system for controlling remote devices comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a computer configured to execute at least one computer program that generates at least one control signal responsive to a system input signal; said computer integrated with a wide area network (WAN);	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and performs translation of format effector characters as needed." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. "Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246.

	Figure 1, Burchfiel page 246.
at least one gateway connected to the WAN configured to receive and translate the at least one control signal; said gateway further configured to transmit a radio-frequency (RF) signal containing the control signal and destination information;	"Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246. "For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. " Burchfiel page 249. Figure 4, Burchfiel page 249.
at least one wireless low-power RF transceiver configured to receive the RF signal from the gateway; said wireless transceiver configured to translate the RF signal to an analog output signal, the wireless transceiver electrically coupled with an actuator; and	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.

	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
an actuator configured to receive the analog output signal from the wireless transceiver, the actuator further configured to translate the analog output signal into a response.	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions

	made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
43. The system defined in claim 42, the system input signal comprising:	The above contentions for claim 42 are hereby incorporated by reference.
a concatenation of information including data from a sensor, transceiver identification information from the originating transceiver, and transceiver identification information for each transceiver that receives and repeats the RF signal.	"The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the programs which deals with control at level M does not see control information at levels less than M; it is inserted by lower level programs on transmission, and stripped off by lower level programs on reception. Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 'Radio Hop' protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figure 3, Burchfiel page 247. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.

46. The system defined in claim 42, wherein the gateway translates the RF signal and the RF control signal into TC/IP for communication over the WAN.	The above contentions for claim 42 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example:

Exhibit P3 – Invalidity Chart for U.S. Patent No. 6,437,692 based on Burchfiel

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed

	over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
47. The system defined in claim 42, wherein the WAN is the Internet.	The above contentions for claim 42 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol

	congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: “The PRNET can also be accessed from other networks via an Internet gateway.” Jubin page 23. ‘217 patent discloses: “The data collection module will send and receiving information to and from

	the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2.

	Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
48. The system defined in claim 42, wherein the WAN is a dedicated Intranet.	The above contentions for claim 42 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249.

	Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.
49. A system for managing an arrangement of application specific remote devices comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a computer configured to execute a multiplicity of computer programs, each computer program executed to generate at least one control signal in response to at least one application system input, said computer integrated with a wide area network (WAN);	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and performs translation of format effector characters as needed." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins

	Radio." Burchfiel page 245. "Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246.
at least one gateway connected to the WAN configured as a two-way communication device to receive and translate the at least one control signal and the at least one application system input; said gateway further configured to translate and transmit a radio-frequency (RF) signal containing the control signal and destination information, said gateway further configured to receive and translate the at least one application system input and source information;	"Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246. "For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. " Burchfiel page 249. Figure 4, Burchfiel page 249.
at least one wireless relatively low-power RF transceiver per computer program configured to receive the RF signal from the gateway; said wireless transceiver configured to translate the RF signal to an analog output signal, the wireless transceiver electrically coupled with an actuator and a sensor;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide

	centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
an actuator configured to receive the analog output signal from the wireless transceiver, the actuator	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging

further configured to translate the analog output signal into a response; and	functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
a sensor configured to translate a physical condition into an analog version of the application system input.	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.

51. The system as defined in claim 49, wherein the at least one gateway translates the RF signal and the RF control signal into TCP/IP for communication over the WAN.	The above contentions for claim 49 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example:

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44.

	"For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
52. The system as defined in claim 49, wherein the WAN in the Internet.	The above contentions for claim 49 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol

	mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: “The PRNET can also be accessed from other networks via an Internet gateway.” Jubin page 23. ‘217 patent discloses: “The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal

	will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in

	the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
53. The system as defined in claim 49, wherein the WAN is a dedicated Intranet.	The above contentions for claim 49 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250.

	"Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.
54. The system as defined in claim 49, wherein the at least one gateway is connected to the WAN by a network selected from the group consisting of a telecommunications network, private radio-frequency network, and a computer network.	Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. "Figure 4 shows the hardware organization of our prototype station: it is a PDP-11 processor interfaced to a packet radio unit. In the initial tests, it will also be connected as a gateway to the ARPANET." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical

	to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.
55. A method of collecting information and providing data services comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
adaptively configuring a data translator at the output of a local controller, wherein the data translator converts the output data stream into an information signal consisting of a transmitter code and an information field;	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections). Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio. It will serve standalone as a repeater; addition of the station interface hardware and software option converts it to a station; addition of the terminal interface hardware and software option converts it to a terminal. The additional functions shown for terminal may either be implemented in a separate microprocessor or provided in a separate memory partition within the terminal's PRU." Burchfiel page 245-246. Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page

	245. "The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the programs which deals with control at level M does not see control information at levels less than M; it is inserted by lower level programs on transmission, and stripped off by lower level programs on reception. Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 'Radio Hop' protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figure 3, Burchfiel page 247. "When any repeater detects a significant routing event, e.g., failure or some previously established route or a request from a terminal to enter the network, the repeater forwards this information over its control connection to the nearest station. Burchfiel page 250.
adaptively configuring at least one transmitter with the data translator, wherein the transmitter converts the information signal into a low-power RF signal;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and

	repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
placing a plurality of relatively low-power radio-frequency (RF) transceivers dispersed geographically wherein the low power RF signal is received and repeated as required to communicate the information signal to a gateway, the gateway providing access to a WAN;	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the station providing initialization and centralized control of parameters for terminal tracking. … Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between the source process ad destination process, and performing end-to-end error detection and correction over this noisy channel. Burchfiel page 245. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway

	function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.
translating the low-power RF signal within the gateway to a WAN compatible data transfer protocol;	"When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.
transferring the translated low-power RF signal via the WAN to a computer wherein the computer is configured to manipulate and store data provided in said signal; and	"When a terminal comes on-line, the station establishes a data connection to it and provides an 'information service' to assist in completing the connection to the destination device, which may be either in the PRN or in the ARPANET." Burchfiel page 250.
granting client access to the computer.	"When a terminal comes on-line, the station establishes a data connection to it

	and provides an 'information service' to assist in completing the connection to the destination device, which may be either in the PRN or in the ARPANET." Burchfiel page 250. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
56. The method of claim 55 wherein the WAN is the Internet.	The above contentions for claim 55 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249.

	Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102.

	The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below.

	However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
57. The method of claim 55 wherein the WAN is an Intranet.	The above contentions for claim 55 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.
59. The method of claim 55 wherein the clients	The above contentions for claim 55 are hereby incorporated by reference.

access the information using a web browser.	Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses:

	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44.

	"For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
60. A method for controlling an existing control system with a local controller comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
adaptively configuring a data translator disposed between and in communication with both a local controller and a wireless transceiver, wherein the data translator is configured to translate the local	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245.

controller data stream into an information signal consisting of a transceiver identification code and a concatenation of function codes, the data translator further configured to translate control signals from the wireless transceiver into local controller recognized control signals;	Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not

	fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
remotely collecting data from the at least one relatively low-powered radio-frequency (RF) transceiver integrated with the data translator;	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248. "A similar mechanism permits centralized collection of traffic statistics, both through examination of counters in PRU memory and through centralized reception of special status conditions such as "trace packets" moving through the network. Burchfiel page 248. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's. Burchfiel page 250.
processing the data into an RF signal;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and

	repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
transmitting the RF signal to a gateway;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A similar mechanism permits centralized collection of traffic statistics, both through examination of counters in PRU memory and through centralized reception of special status conditions such as "trace packets" moving through the network. Burchfiel page 248. "Once the station has collected a et of traffic statistics, it will normally forward these measurements to a service host for detailed statistical analysis, logging and plotting." Burchfiel page 248.
translating the data in the RF signal into a network transfer protocol;	Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249.

	Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.
sending the translated data to a computer, wherein the computer is configured to appropriately respond to the data generated by at least one sensor by generating an appropriate control signal;	"Once the station has collected a set of traffic statistics, it will normally forward these measurements to a service host for detailed statistical analysis, logging and plotting." Burchfiel page 248. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
sending the control signal via the network to the gateway;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital

	terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246.
translating the control signal from a network transfer protocol into an RF control signal;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.

	"One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
transmitting the RF control signal;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and

	repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246.
receiving the RF control signal;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "One of the basic facilities required in the PRN is support of interprocess

	connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246.
translating the received RF control signal into a local controller recognized control signal; and	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
applying the local controller recognized control signal via a local control to effect the desired system response.	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
61. The method of claim 60, wherein the step of transmitting the RF control signal is further	The above contentions for claim 60 are hereby incorporated by reference.

performed by at least one transceiver, wherein the transceiver is configured to receive and transmit the RF control signal.	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination." Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246.
62. The method of claim 60, wherein the network is the Internet.	The above contentions for claim 60 are hereby incorporated by reference. Figure 1, Burchfiel page 246.

	"When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.

	'217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57.

	'773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
63. The method of claim 60, wherein the network is an Intranet.	The above contentions for claim 60 are hereby incorporated by reference. Figure 1, Burchfiel page 246. "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of

	the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250.
64. The method of claim 60, wherein the network transfer protocol is TCP/IP.	The above contentions for claim 60 are hereby incorporated by reference. Figure 1, Burchfiel page 246. “When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250.

	"Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore,

	by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the

	node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

Exhibit P3 – Invalidity Chart for U.S. Patent No. 8,013,732 based on Burchfiel

The '732 Patent – Claim	J. Burchfiel et al., *"Functions and structure of a packet radio station,"* National Computer Conference, 1975.
1. A system for remote data collection, assembly, storage, event detection and reporting and control, comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and performs translation of format effector characters as needed." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. "Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246.

	Figure 1, Burchfiel page 246. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As

	shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

a plurality of transceivers dispersed geographically at defined locations, each transceiver electrically inter- faced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission;	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "The protocols of the Packet Radio Network are layered or hierarchical. … Figure 3 shows this layering explicitly…." Burchfiel page 246. Figure 3, Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.

Exhibit P3 – Invalidity Chart for U.S. Patent No. 8,013,732 based on Burchfiel

at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN and wherein at least one of said plurality of transceivers is also electrically interfaced with an actuator to control an actuated device.	"Our prototype station has the additional station functions implemented in a Digital Equipment Corp. PDP-11, which is also interfaced to the ARPANET." Burchfiel page 246. Figure 1, Burchfiel page 246. "The protocols of the Packet Radio Network are layered or hierarchical. … Figure 3 shows this layering explicitly…." Burchfiel page 246. Figure 3, Burchfiel page 247. "For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. " Burchfiel page 249. Figure 4, Burchfiel page 249. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap

	conditions spontaneously emitted by PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23

	U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be

	performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
13. In a system comprising a plurality of wireless devices configured for remote wireless communication and comprising a device for monitoring and controlling remote devices, the device comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245.

information and identification information transmitted from another wireless transceiver in a predetermined signal type;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "The protocols of the Packet Radio Network are layered or hierarchical. … Figure 3 shows this layering explicitly…." Burchfiel page 246. Figure 3, Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"The protocols of the Packet Radio Network are layered or hierarchical. … Figure 3 shows this layering explicitly…." Burchfiel page 246. Figure 3, Burchfiel page 247.
a data controller operatively coupled to the transceiver and the sensor, the data controller	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control

configured to control the transceiver and receive data from the sensor, the data controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.	connection), and each station (data and control connections)." Burchfiel page 245. "In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and performs translation of format effector characters as needed." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245. Figure 1, Burchfiel page 246. "The additional functions shown for terminal may either be implemented in a separate microprocessor or provided in a separate memory partition within the terminal's PRU, timesharing its microprocessor for economy." Burchfiel page 246.
14. The device of claim 13, wherein the data controller is configured to receive data packets comprising control signals and in response to the control signals provide a control signal to an actuator for implementation of a command.	The above contentions for claim 13 are hereby incorporated by reference. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. "The statistics collection module is another independent process which gathers

	data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23

	U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the

	MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
16. The device of claim 13**,** wherein the data controller is configured to receive data packets comprising a function code, and in response to the function code, implement a function.	The above contentions for claim 13 are hereby incorporated by reference. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions.

	When one these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51.

	U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
17. The device of claim 13**,** wherein the data controller is configured to format data packets for transmission via the transceiver, the data packets comprising a function code corresponding to sensed	The above contentions for claim 13 are hereby incorporated by reference. "The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control

data and the unique identification code	connection), and each station (data and control connections)." Burchfiel page 245. "In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and performs translation of format effector characters as needed." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245. Figure 1, Burchfiel page 246. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

	Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses:

	"Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements."

	'903, 4:23-31.
18. The device of claim 13, further comprising a memory to store one or more function codes corresponding to the device, the function codes corresponding to a number of functions the data controller can implement.	The above contentions for claim 13 are hereby incorporated by reference. "A similar mechanism permits centralized collection of traffic statistics, both through examination of counters in PRU memory and through centralized collection of special status conditions such as "trace packets" moving through the network." Burchfiel page 248. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250.

Exhibit P3 – Invalidity Chart for U.S. Patent No. 8,013,732 based on Burchfiel

19. The device of claim 13, further comprising an actuator configured to receive command data from the controller and in response implement the command.	The above contentions for claim 13 are hereby incorporated by reference. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings

	of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60.

	"During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses:

	"In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
31. A wireless communication system including wireless communication devices capable of wireless communication, the wireless communication system comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
at least one wireless communication device comprising a transceiver, the transceiver having a unique identification code and being interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from another wireless transceiver in a predetermined signal type;	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is

	programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "The protocols of the Packet Radio Network are layered or hierarchical. … Figure 3 shows this layering explicitly…." Burchfiel page 246. Figure 3, Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248.
a controller operatively coupled to the transceiver and the sensor, the controller configured to control transceiver operations and receive data from the sensor, the controller configured to format data packets for transmission via the transceiver with at least some data packets comprising data representative of data sensed with the sensor; and	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "In addition to the communications support, the terminal must also have a terminal handler program which manages terminal input and output buffers and performs translation of format effector characters as needed." Burchfiel page

	245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. These functions are shown in Figure 1." Burchfiel page 245. Figure 1, Burchfiel page 246. "The additional functions shown for terminal may either be implemented in a separate microprocessor or provided in a separate memory partition within the terminal's PRU, timesharing its microprocessor for economy." Burchfiel page 246. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250.
wherein the controller is configured to receive control signals from a data packet and based on the control signals send instructions to an actuator to implement a command.	"The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses:

	"Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the

	MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
32. The wireless communication system of claim 31, further comprising at least one gateway connected to a WAN configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to a computing device over the WAN.	The above contentions for claim 31 are hereby incorporated by reference. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "Our prototype station has the additional station function implemented in a Digital Equipment Corp. PDP-11, which is also interfaced with the ARPANET." Burchfiel page 246.

Exhibit P3 – Invalidity Chart for U.S. Patent No. 8,013,732 based on Burchfiel

	"When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1.For communication with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway…." Burchfiel page 249. "Figure 4 shows the hardware organization of our prototype station: it is a PDP-11 processor interfaced to a packet radio unit. In the initial tests, it will also be connected as a gateway to the ARPANET." Burchfiel page 249." "When a terminal comes on-line, the station establishes a data connection to it. And provides an 'information service' to assist in completing the connection to the destination device, which may be either in the PRN or in the ARPANET." Burchfiel page 250. "Finally, the PRN TELNET process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet

	gateway." Jubin page 23. '217 patent discloses: "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. '650 patent discloses "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57.

	'773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
33. The wireless communication system of claim 31, further comprising a computing device configured to receive user input and based on user input, the computing device formatting control signals, and wherein the controller is configured to receive the control signals via wireless transmission and take action based on the control signals.	The above contentions for claim 31 are hereby incorporated by reference. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248. "The debug program is another independent process. On request from the

	maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

	Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred

	embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

34. The wireless communication system of claim 31, wherein the controller is configured to provide one or more function codes in the data packet in response to data sensed by the sensor.	The above contentions for claim 31 are hereby incorporated by reference. "The 'function fields' provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel pag3 247. Figure 3, Burchfiel page 247. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator."

	Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51.

	U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
35. The wireless communication system of claim 31, wherein the controller comprises a memory containing a plurality of function codes specific to	The above contentions for claim 31 are hereby incorporated by reference. "A similar mechanism permits centralized collection of traffic statistics, both

the sensor.	through examination of counters in PRU memory and through centralized collection of special status conditions such as "trace packets" moving through the network." Burchfiel page 248. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g.. hardware failure. These functions made it possible to do centralized software maintenance of remote, unattended repeaters. The maintenance terminal of the station will normally be attended by an operator or system programmer." Burchfiel page 248. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one these conditions is encountered … it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250.

Exhibit P3 – Invalidity Chart for U.S. Patent No. 8,754,780 based on Burchfiel

The '780 Patent – Claim	J. Burchfiel et al., *"Functions and structure of a packet radio station,"* National Computer Conference, 1975.
1. In a system comprising a plurality of wireless devices, a device comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from a second wireless transceiver in a predetermined signal type;	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio. It will serve as a standalone repeater; addition of the station interface hardware and software option converts it to a station; addition of the terminal interface hardware and software option converts it to a terminal." Burchfiel pages 245-246.

	Figure 1, Burchfiel page 246. "Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247.
the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the second wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking." Burchfiel page 245.
a controller operatively coupled to the transceiver and the sensor, the controller configured to control the transceiver and receive data from the sensor, the controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is provided in its IMP-16 microprocessor." Burchfiel page 245. "The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (salve) routine in each repeater. These features are shown in Figure 1." Burchfiel page 245. Figure 1, Burchfiel page 246. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the

	station's PRU. Its ends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establish control connections to the PRU's of the newly-discovered devices." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory and by receiving statistics trap condition spontaneously emitted by PRU's." Burchfiel page 250.
2. The device of claim 1, wherein the controller is configured to receive data packets comprising control signals and in response to the control signals provide a control signal to an actuator for implementation of a command.	The above contentions for claim 1 are hereby incorporated by reference. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. Its ends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establish control connections to the PRU's of the newly-discovered devices." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory and by receiving statistics trap condition spontaneously emitted by PRU's." Burchfiel page 250.

	"The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered (assuming the PRU is still operational) it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off,

	and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data

	for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses:

	"Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
4. The device of claim 1, wherein the controller is configured to receive data packets comprising a function code, and in response to the function code, implement a function.	The above contentions for claim 1 are hereby incorporated by reference. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. Its ends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establish control connections to the PRU's of the newly-discovered devices." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory and by receiving statistics trap condition spontaneously emitted by PRU's." Burchfiel page 250. "The debug program is another independent process. On request

	from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered (assuming the PRU is still operational) it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

	Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent

	week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses:

	"Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
5. The device of claim 1, wherein the controller is configured to format data packets for transmission via the transceiver, the data packets comprising a function code corresponding to sensed data and the unique identification code that identifies the transceiver.	The above contentions for claim 1 are hereby incorporated by reference. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establish control connections to the PRU's of the newly-discovered devices." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory and by receiving statistics trap condition spontaneously emitted by PRU's." Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module

	to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered (assuming the PRU is still operational) it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

	Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity."

	U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a

Exhibit P3 – Invalidity Chart for U.S. Patent No. 8,754,780 based on Burchfiel

	repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
6. The device of claim 1, further comprising a memory to store one or more function codes corresponding to the device, the function codes corresponding to a number of functions the controller can implement.	The above contentions for claim 1 are hereby incorporated by reference. "The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is provided in its IMP-16 microprocessor." Burchfiel page 245. "The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (salve) routine in each repeater. These features are shown in Figure 1." Burchfiel page 245. Figure 1, Burchfiel page 246.

7. The device of claim 1, further comprising an actuator configured to receive command data from the controller and in response implement a command.	The above contentions for claim 1 are hereby incorporated by reference. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establish control connections to the PRU's of the newly-discovered devices." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory and by receiving statistics trap condition spontaneously emitted by PRU's." Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered (assuming the PRU is still operational) it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23

	U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51.

	U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

8. The device of claim 1, wherein the second transceiver is nearby to the transceiver.	The above contentions for claim 1 are hereby incorporated by reference. "Initialization of the PRN includes the following steps: …2)Configuring the PRN by loading each repeater with routing parameters which control the packet store-and-forward program. These parameters specify forwarding of packets 9in the direction of minimum distance] to the next repeater within "earshot." Burchfiel page 247. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establish control connections to the PRU's of the newly-discovered devices." Burchfiel page 250.

Exhibit P3 – Invalidity Chart for U.S. Patent No. 8.908,842 based on Burchfiel

The '842 Patent – Claim	J. Burchfiel et al., *"Functions and structure of a packet radio station,"* National Computer Conference, 1975.
1. A device for communicating information, the device comprising:	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245.
a low-power transceiver configured to wirelessly transmit a signal comprising instruction data for delivery to a network of addressable devices;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission is each direction piggybacked into the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As Measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establishes control connections to the PRU's of newly-discovered devices." Burchfiel page 250.

	"The statistics collection module is another independent process which gathers data both by examining PRU memory and by receiving statistics trap condition spontaneously emitted by PRU's." Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered (assuming the PRU is still operational) it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250.
an interface circuit for communicating with a central location; and	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the station providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is provided in its IMP-16 microprocessor." Burchfiel page 245. "The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of

	hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250.
a controller coupled to the interface circuit and to the low-power transceiver, the controller configured to establish a communication link between at least one device in the network of addressable devices and the central location using an address included in the signal, the communication link comprising one or more devices in the network of addressable, the controller further configured to receive one or more signals via the low-power transceiver and communicate information contained within the signals to the central location.	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters with stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is provided in its IMP-16 microprocessor. " Burchfiel page 245. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission is each direction piggybacked into the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246. "The protocols of the Packet Radio Network are layered or hierarchical. … Figure 3 shows this layering explicitly:…." Burchfiel page 246. Figure 3, Burchfiel page 247. "Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247.

Exhibit P3 – Invalidity Chart for U.S. Patent No. 8.908,842 based on Burchfiel

	"In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As Measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establishes control connections to the PRU's of newly-discovered devices." Burchfiel page 250.
7. The device of claim 1, wherein the controller is further configured to communicate a transceiver identification code to the central location via the interface circuit.	The above contentions for claim 1 are hereby incorporated by reference "Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247. "The protocols of the Packet Radio Network are layered or hierarchical. … Figure 3 shows this layering explicitly:…." Burchfiel page 246. Figure 3, Burchfiel page 247.
9. The device of claim 1, wherein transmitted and received signals further comprise a field configured to indicate a destination device for a subsequent transmission path to follow.	The above contentions for claim 1 are hereby incorporated by reference "Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247. "The protocols of the Packet Radio Network are layered or hierarchical. … Figure 3 shows this layering explicitly:…." Burchfiel page 246.

	Figure 3, Burchfiel page 247. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered (assuming the PRU is still operational) it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250.
16. A device for communicating information, the device comprising:	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245.
a processor; and	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters with stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is provided in its IMP-16 microprocessor. " Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245.

	Figure 1, Burchfiel page 246.
a memory, the memory comprising logical instructions that when executed by the processor are configured to cause the device to:	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245.
wirelessly transmit a signal comprising instruction data for delivery to a network of addressable low-power transceivers;	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is provided in its IMP-16 microprocessor." Burchfiel page 245. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission is each direction piggybacked into the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establishes control connections to the PRU's of newly-discovered devices." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory and by receiving statistics trap condition spontaneously emitted by

	PRU's." Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered (assuming the PRU is still operational) it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250.
establish a communication link between at least one low-power transceiver in the network of addressable low-power transceivers and a central location based on an address included in the signal, the communication link comprising one or more low-power transceivers in the network of addressable low-power transceivers; and	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establishes control connections to the PRU's of newly-discovered devices." Burchfiel page 250. "The statistics collection module is another independent process

	which gathers data both by examining PRU memory and by receiving statistics trap condition spontaneously emitted by PRU's." Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered (assuming the PRU is still operational) it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250.
receive one or more low-power RF signals and communicate information contained within the signals to the central location along with a unique transceiver identification number over the communication link.	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "Each PRU (station, repeater, terminal) has a unique, hardwired I.D." Burchfiel page 247. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As

	measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establishes control connections to the PRU's of newly-discovered devices." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory and by receiving statistics trap condition spontaneously emitted by PRU's." Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered (assuming the PRU is still operational) it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250.
17. A device for communicating information, the device comprising:	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245.
a low-power transceiver that is configured to wirelessly receive a signal including an instruction data from a remote device;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245.

	Figure 1, Burchfiel page 246. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission is each direction piggybacked into the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As Measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establishes control connections to the PRU's of newly-discovered devices." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory and by receiving statistics trap condition spontaneously emitted by PRU's." Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each

	command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered (assuming the PRU is still operational) it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250.
an interface circuit for communicating with a central location;	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the station providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is provided in its IMP-16 microprocessor." Burchfiel page 245. "The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250.
a controller coupled to the interface circuit and to the low-power transceiver, the controller being configured to establish a communication link between the remote device and the central location using address-indicative data included in the signal;	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters with stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is

	provided in its IMP-16 microprocessor. " Burchfiel page 245. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission is each direction piggybacked into the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246. "The protocols of the Packet Radio Network are layered or hierarchical. … Figure 3 shows this layering explicitly:…." Burchfiel page 246. Figure 3, Burchfiel page 247. "Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). As Measurement information comes back on this connection, the control process fills in entries in the connectivity matrix, and establishes control connections to the PRU's of newly-discovered devices." Burchfiel page 250.
the controller further configured to receive one or more data signals from the central location via the interface circuit and	"The statistics collection module is another independent process which gathers data both by examining PRU memory and by

communicate information contained within the signals to the remote device.	receiving statistics trap condition spontaneously emitted by PRU's." Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command. There are also commands for setting traps on anomalous program conditions. When one of these conditions is encountered (assuming the PRU is still operational) it sends the appropriate trap code over the debugging connection to the debugger." Burchfiel page 250.

Exhibit P3 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Burchfiel

The '893 Patent – Claim	J. Burchfiel et al., *"Functions and structure of a packet radio station,"* National Computer Conference, 1975.
1. A system for communicating commands and sensed data between remote devices, the system comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a plurality of transceivers, each transceiver being in communication with at least one other of the plurality of transceivers, wherein each transceiver has a unique address, wherein the unique address identities an individual transceiver, wherein each transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with the other transceivers via preformatted messages;	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246. "The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the program which deals with control at level M does not see control information at levels less than M; it is inserted by lower level programs on transmission, and stripped off by lower level programs on reception. Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 'Radio Hop' protocol which provides broadcast synchronization and erro detection for transmission of the packet from one PRU to the next." Burchfiel page 246.

	Figure 3, Burchfiel page 247. "Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247.
a controller, connected to one of the plurality of transceivers, the controller being in communications with each of the plurality of transceivers via a controller transceiver, the controller communicating via preformatted messages;	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is providing in its IMP-16 microprocessor. " Burchfiel page 245. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. "Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 "Radio Hop" protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figs. 2 and 3. Burchfiel pages 246-247.
wherein the preformatted messages comprises at least one packet, wherein the packet comprises:	"Flow control is established by the convention that the sender can only send up to N packets ahead of the last packet which was acknowledged. Equivalently, a source may not have more than N packets 'in the pipeline' at one time. To keep the repeater code as

	simple as possible, N should be equal to one (packet-at-a-time) for repeater control connections. This protocol is a simplified subset of the protocol developed by Cerf and Kahn [7] for internetwork communications. The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the program which deals with control at level M does not see control information as levels less than M; it is inserted by lower level programs on transmission, and stripped off by lower level programs on reception. Figure 3 shows this layering explicitly; the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based in a level 0 'Radio Hop' protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246.
a receiver address comprising a scalable address of the at least one of the intended receiving transceivers;	*Id.* "Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between source processes and destination processes, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. Figure 2, Burchfiel page 246. Figure 3, Burchfiel page 247. To the extent that Plaintiffs contend that this claim limitation is

	not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26.

Exhibit P3 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Burchfiel

	In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module

	sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing

	performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network

	numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
sender address comprising the unique address of the sending transceiver;	*Id.* "Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between source processes and destination processes, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. Figure 2, Burchfiel page 246. Figure 3, Burchfiel page 247.
a command indicator comprising a command code;	"The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel

	page 248. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute

	jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition

	devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

at least one data value comprising a scalable message; and	*Id.* Figure 2, Burchfiel page 246. Figure 3, Burchfiel page 247.
an error detector comprising a redundancy check error detector; and	*Id.* "Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between source processes and destination processes, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. Figure 3, Burchfiel page 247.
wherein the controller sends preformatted command messages via the controller transceiver, and the plurality of transceivers send preformatted response messages.	*Id.* "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. The functions are shown in Figure 1." Burchfiel page 245. Figure 1, Burchfiel page 246. Figure 2, Burchfiel page 246. In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the

	station's PRU. It sends commands over the connection to trigger connectivity measurements (exploratory pacekts which request answerback from stations and repeaters within earshot). As measurement information comes back on the connection, the control process fills entries in the connectivity matrix, and established control connections to the PRU's of the newly discovered devices." Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by the PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250.
2. The system of claim 1, wherein the plurality of transceivers further comprise at least one integrated transceiver, wherein the integrated transceiver comprises:	The above contentions for claim 1 are hereby incorporated by reference.
one of the plurality of transceivers; and	"The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the

	PRU responds with a positive acknowledgement for each command." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by the PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250.
a sensor detecting a condition and outputting a sensed data signal to the transceiver.	"The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by the PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250.
3. The system of claim 2, wherein the at least one integrated transceiver receives the preformatted command message requesting sensed data, confirms the receiver address as its own unique address, receives the sensed data signal, formats the sensed data signal into scalable byte segments, determines a number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet, wherein the packets are equal to the number of segments.	The above contentions for claim 2 are hereby incorporated by reference. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each

	command." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by the PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses:

	"PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of

Exhibit P3 – Invalidity Chart for U.S. Patent No. 6,914,893 based on Burchfiel

	the fields are updated by every intermediate packet radio." Jubin page 25-26. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition

	devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

	In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module

	sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing

	performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network

	numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
10. The system of claim 1, wherein the plurality of transceivers further comprise at least one actuated transceiver, wherein the actuated transceiver comprises:	The above contentions for claim 1 are hereby incorporated by reference.
one of the plurality of transceivers;	"The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by the PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250
a sensor detecting a second condition and outputting a sensed data signal to the transceiver; and	"The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the

	PRU responds with a positive acknowledgement for each command." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by the PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250
an actuator controlling a third condition and receiving control signals from the transceiver.	"The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by the PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250
17. A system for communicating commands and sensed data between remote devices, the system comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
a plurality of transceivers, each transceiver being in communication with at least one other of the plurality of	"The set of functions which appear in common in a station, repeater, and terminal are identified in Figure 1 as a Packet Radio

transceivers, wherein each transceiver has a unique address, wherein the unique address identities an individual transceiver, wherein each transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with the other transceivers via preformatted messages;	Unit, or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, page 246. "The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the program which deals with control at level M does not see control information at levels less than M; it is inserted by lower level programs on transmission, and stripped off by lower level programs on reception. Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 'Radio Hop' protocol which provides broadcast synchronization and erro detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figure 3, Burchfiel page 247. "Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247.
a controller, connected to one of the plurality of transceivers, the controller being in communications with each of the plurality of transceivers via a controller transceiver, the controller communicating via preformatted messages, wherein the preformatted messages comprises at least one packet, wherein the packet comprises:	"The dynamic packet routing capability (packet store-and-forward) is programmed in the repeaters, with the stations providing initialization and centralized control of parameters for terminal tracking. The programmable capability of the repeater is providing in its IMP-16 microprocessor. " Burchfiel page 245.

	"Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. "Figure 3 shows this layering explicitly: the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based on a level 0 "Radio Hop" protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figs. 2 and 3. Burchfiel pages 246-247.
a receiver address comprising a scalable address of the at least one of the intended receiving transceivers;	"Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between source processes and destination processes, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "Flow control is established by the convention that the sender can only send up to N packets ahead of the last packet which was acknowledged. Equivalently, a source may not have more than N packets 'in the pipeline' at one time. To keep the repeater code as simple as possible, N should be equal to one (packet-at-a-time) for repeater control connections. This protocol is a simplified subset of the protocol developed by Cerf and Kahn [7] for internetwork communications. The protocols of the Packet Radio

	Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the program which deals with control at level M does not see control information as levels less than M; it is inserted by lower level programs on transmission, and stripped off by lower level programs on reception. Figure 3 shows this layering explicitly; the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based in a level 0 'Radio Hop' protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figs. 2 and 3. Burchfiel pages 246-247. "Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247.
sender address comprising the unique address of the sending transceiver;	"Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between source processes and destination processes, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "Flow control is established by the convention that the sender can only send up to N packets ahead of the last packet which was acknowledged. Equivalently, a source may not have more than N packets 'in the pipeline' at one time. To keep the repeater code as simple as possible, N should be equal to one (packet-at-a-time)

	for repeater control connections. This protocol is a simplified subset of the protocol developed by Cerf and Kahn [7] for internetwork communications. The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the program which deals with control at level M does not see control information as levels less than M; it is inserted by lower level programs on transmission, and stripped off by lower level programs on reception. Figure 3 shows this layering explicitly; the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based in a level 0 'Radio Hop' protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figs. 2 and 3. Burchfiel pages 246-247. "Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247.
a command indicator comprising a command code;	"The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some

	anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). " Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by the PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250
at least one data value comprising a scalable message; and	"Flow control is established by the convention that the sender can only send up to N packets ahead of the last packet which was acknowledged. Equivalently, a source may not have more than N packets 'in the pipeline' at one time. To keep the repeater code as simple as possible, N should be equal to one (packet-at-a-time) for repeater control connections. This protocol is a simplified subset of the protocol developed by Cerf and Kahn [7] for

	internetwork communications. The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the program which deals with control at level M does not see control information as levels less than M; it is inserted by lower level programs on transmission, and stripped off by lower level programs on reception. Figure 3 shows this layering explicitly; the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based in a level 0 'Radio Hop' protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figure 2, Burchfiel page 246. Figure 3, Burchfiel page 247. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below.

	For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs'

	stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command

	station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2.

	U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first,

	broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a

	network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing

	explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector comprising a redundancy check error detector;	"Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between source processes and destination processes, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. Figure 3, Burchfiel page 247.
wherein the controller sends preformatted command messages via the controller transceiver, and the plurality of transceivers send preformatted response messages; and	*Id.* "The programs which provide centralized monitoring, debugging, and statistics collection are located in the station, with a small (slave) routine in each repeater. The functions are shown in

	Figure 1." Burchfiel page 245. Figure 1, Burchfiel page 246. Figure 2, Burchfiel page 246. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). " Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by the PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250
wherein at least one of the plurality of transceivers further sends preformatted emergency messages.	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps"

	which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation. For example, U.S. Patent No. 5,907,491 discloses that "[w]hile it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28. U.S. Patent No. 6,366,217, discloses that "[t]he information signal contains the data collected by the sensor interface module, or the emergency code." '217 patent, 13:66-14:1.

	U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
18. The system of claim 17, wherein the controller maintains periods of silence by not sending the preformatted command messages during predetermined time periods; and	The above contentions for claim 17 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation. For example, U.S. Patent No. 5,907,491 discloses that "[w]hile it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28.

	U.S. Patent No. 6,366,217, discloses that "[t]he information signal contains the data collected by the sensor interface module, or the emergency code." '217 patent, 13:66-14:1. U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
wherein the at least one of the plurality of transceivers detects a period of silence and sends the preformatted emergency message during the period of silence.	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation. For example, U.S. Patent No. 5,907,491 discloses that "[w]hile it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28.

	U.S. Patent No. 6,366,217, discloses that "[t]he information signal contains the data collected by the sensor interface module, or the emergency code." '217 patent, 13:66-14:1. U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
37. A method of communicating between geographically remote devices, the method comprising:	"A packet radio network is a digital broadcast channel, fixed and mobile digital terminals which are sources and sinks of information, stations which provide centralized routing control and interconnections to other networks, and repeaters which provide area coverage for mobile terminals by performing store-and-forward function on the radio broadcast channel." Burchfiel page 245.
sending a message;	"Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between source processes and destination processes, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246.

	Figure 2, Burchfiel page 246.
receiving the message at one or more of the remote devices;	"Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between source processes and destination processes, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "Since most expected uses of the PRN will require bi-directional communication, the PRN connection is bi-directional, with flow control and error control information for data transmission in each direction piggybacked onto the data flow in the opposite direction. This arrangement is depicted in Figure 2." Burchfiel page 246. Figure 2, Burchfiel page 246.
processing the message;	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "The set of functions which appear in common in a station, repeater and terminal are identified in Figure 1 as a Packet Radio Unit , or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246.
preparing a response message;	"In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the

	station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). " Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each command." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by the PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250
receiving the response message;	"In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). " Burchfiel page 250.
processing the response message	"The programs for providing interprocess connections within the PRN must be programmed into each terminal (data connection), each repeater (control connection), and each station (data and control connections)." Burchfiel page 245. "The set of functions which appear in common in a station,

	repeater and terminal are identified in Figure 1 as a Packet Radio Unit , or PRU, which has been implemented as a standard piece of hardware and software by Collins Radio." Burchfiel page 245. Figure 1, Burchfiel page 246.
wherein all messages comprise at least one packet, the packet having a predetermined format;	"Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between source processes and destination processes, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "Flow control is established by the convention that the sender can only send up to N packets ahead of the last packet which was acknowledged. Equivalently, a source may not have more than N packets 'in the pipeline' at one time. To keep the repeater code as simple as possible, N should be equal to one (packet-at-a-time) for repeater control connections. This protocol is a simplified subset of the protocol developed by Cerf and Kahn [7] for internetwork communications. The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the program which deals with control at level M does not see control information as levels less than M; it is inserted by lower level programs on transmission, and stripped off by lower level programs on reception. Figure 3 shows this layering explicitly; the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based in a level 0 'Radio Hop' protocol which provides

	broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figure 3, Burchfiel page 247.
wherein the predetermined format comprises:	
a receiver address comprising a scalable address of the at least one of the intended receiving remote devices;	"Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247. "Once the station has labelled all PRU's and established connections to them, the information for maintaining these connections is entered into the station's connection table. This contains the status information described above for handling the connection protocol." Burchfiel page 247. Figure 3, Burchfiel page 247. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and

	fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g.,

	information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some

	information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43.

	In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a sender address comprising an unique address of the sender;	"Each PRU (station, repeater, terminal) has a unique hardwired I.D." Burchfiel page 247. "Once the station has labelled all PRU's and established connections to them, the information for maintaining these

	connections is entered into the station's connection table. This contains the status information described above for handling the connection protocol." Burchfiel page 247. Figure 3, Burchfiel page 247.
a command indicator comprising a command code;	"The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. "In the PRN initialization procedure, the control process calls on the connection module to establish a control connection to the station's PRU. It sends commands over this connection to trigger connectivity measurements (exploratory packets which request answerback from stations and repeaters within earshot). " Burchfiel page 250. "The debug program is another independent process. On request from the maintenance terminal, it calls on the connection module to open a debugging connection to the PRU of interest. The debugger sends commands over this connection to examine or deposit words in the PRU's microprocessor memory, and the PRU responds with a positive acknowledgement for each

	command." Burchfiel page 250. "The statistics collection module is another independent process which gathers data both by examining PRU memory, and by receiving statistics trap conditions spontaneously emitted by the PRU's. This operation parallels the operation of the debugger described above." Burchfiel page 250. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses:

	"PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23 U.S Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses:

	"Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed

	through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a scalable data value comprising a scalable message; and	Figures 2 and 3, Burchfiel page 246-247. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in Burchfiel, it would have been obvious to a person ordinary skill in the art to combine and/or modify Burchfiel with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). …

	Routing Header: The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are

	supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network

	service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that

	uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector that is a redundancy check error detector; and	"Reliable data transmission between PRN data sources and sinks is required in spite of errors and transmission 'collisions' on the broadcast channel. This is achieved by defining a logical entity called a 'connection' between source processes and destination processes, and performing end-to-end error detection and correction over this noisy channel." Burchfiel page 245. "Flow control is established by the convention that the sender can only send up to N packets ahead of the last packet which was acknowledged. Equivalently, a source may not have more than N packets 'in the pipeline' at one time. To keep the repeater code as simple as possible, N should be equal to one (packet-at-a-time) for repeater control connections. This protocol is a simplified

	subset of the protocol developed by Cerf and Kahn [7] for internetwork communications. The protocols of the Packet Radio Network are layered, or hierarchical. The program which deals with control information at level M passes control and data for all levels greater than M as transparent data. Conversely, the program which deals with control at level M does not see control information as levels less than M; it is inserted by lower level programs on transmission, and stripped off by lower level programs on reception. Figure 3 shows this layering explicitly; the connection protocol described above is the level 2 protocol, based on the level 1 routing protocol which controls the PRN store-and-forward routing for the packet. The routing protocol is itself based in a level 0 'Radio Hop' protocol which provides broadcast synchronization and error detection for transmission of the packet from one PRU to the next." Burchfiel page 246. Figure 3, Burchfiel page 247.
wherein the steps of sending and receiving are repeated until the message is received by the intended receiver.	"One of the basic facilities required in the PRN is support of interprocess connections which provide reliable delivery of data from a PRN source to a PRN destination. Burchfiel page 246. "Dynamic routing changes are performed locally within the PRN by permitting a repeater to specify an alternate address for the next hop after some number of unsuccessful attempts to forward the packet along its specified route." Burchfiel page 247.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

The '492 Patent – Claim	U.S. Patent No. 6,366,217
1. In a communication system to communicate command and sensed data between remote devices, the system comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a receiver address comprising a scalable address of at least one remote device;	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60. '217 patent, Figure 21. "As shown in FIG. 21, information is transmitted in a 32 bit address and information packet to the data collection module. This 32 bit packet includes the sensor interface module's identification and the transmitted information." '217 patent 14:3-7. "The address 1456 is a 32-bit or 4-byte sensor interface module address which is transmitted to the data collection module 110." '217 patent, 14:17-18. "In the preferred embodiment, the header information is approximately 65 bytes of information and the data bytes are approximately 8 bytes of information." '217 patent, 15:13-15.

	"After a data packet has been collected, the data will be transmitted to a data collection module or other device using Frequency Shift Keying (FSK) modulation." '217 16:6-8. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. "Data repeater module processors communicate using SLIP encapsulated Internet Protocol (IP) datagrams. An IP datagram from a data collection module processor is sent to its router (via SLIP) for transport to the destination router and its data collection

	module processor. Only the 16-but Total Length and 32-bit Destination Address fields of an IP datagram are used by the router. The following shows the general IP protocol for data repeater module communications." '217 patent, 35:56-36:25 (including tables showing Destination Address). To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields).

	"The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class

	address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message

	format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space.

	Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a command indicator comprising command code;	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below.

	For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps"

	which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data,

	functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a data value comprising a scalable message; and	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60. "In the preferred embodiment, the header information is approximately 65 bytes of information and the data bytes are approximately 8 bytes of information." '217 patent, 15:13-15. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs'

	stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	"The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the

	first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385,

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a controller associated with a remote device comprising a transceiver configured to send and receive wireless signals, the remote device configured to send a preformatted message comprising the receiver address, a command indicator, and the data value via the transceiver to at least one other remote device.	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware;

	battery power supply and/or converter for external power; and a transmitter.” ‘217 patent, 7:35-48. “d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board.” ‘217 patent, 12:27-41. ‘217 patent, Figure 19.
2. The system of claim 1, further comprising:	The above contentions for claim 1 are hereby incorporated by reference.
a plurality of transceivers each having a unique address, the transceiver being one of the plurality of transceivers;	“The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter.” ‘217 patent, 7:35-48.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	"Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The sensor interface module is programed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and

	data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

a plurality of controllers associated with each the controller associated with at least one of the transceivers, the controller being in communication with at least one other transceiver with a preformatted message, the preformatted message having at least one scalable field;	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent, Figure 19. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine

	and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable

	fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43.

	‘252 patent, Figure 31. “For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module’s assigned tier address for that network service module to be addressed.” ‘252, 42:18-39. “FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and “network message” field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields.

	Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
at least one sensor associated with at least one of the transceivers to detect a condition and output a data signal to the transceiver; and	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to

	a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The sensor interface module is programed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
at least one actuator associated with at least one of the transceivers to activate a device.	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
3. The system of claim 1, wherein the controller sends the preformatted message via an associated transceiver, and at least one transceiver sends the preformatted response message.	The above contentions for claim 1 are hereby incorporated by reference. "Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29.
4. The system of claim 1, wherein at least one transceiver receives the preformatted message requesting sensed data, confirms the receiver address as its own unique address, receives a sensed data signal, formats the sensed data signal into scalable byte segments, determines the number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet.	The above contentions for claim 1 are hereby incorporated by reference. "Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more

	of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets:

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43.

	'252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the

	nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields.

	Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
6. The system of claim 1, wherein each remote device is adapted to transmit and receive radio frequency transmissions to and from at least one other transceiver.	The above contentions for claim 1 are hereby incorporated by reference. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
8. A method of communicating command and sensed data between remote wireless devices, the method comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
providing a receiver to receive at least one message;	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water

	meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The sensor interface module is programed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	"The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for

	transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
wherein the message has a packet comprising a command indicator comprising a command code, a scalable data value comprising a scalable message, and an error detector that is a redundancy check error detector; and	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29. "FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60. "In the preferred embodiment, the header information is approximately 65 bytes of information and the data bytes are approximately 8 bytes of information." '217 patent, 15:13-15. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and

	fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel

	page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

	In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module

	sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing

	performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network

	numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
providing a controller to determine if at least one received message is a duplicate message and determining a location from which the duplicate message originated.	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41.

	'217 patent, Figure 19.
9. The method of claim 8, further comprising providing at least one remote wireless communication device, wherein at least one of the devices comprise geographically remote transceivers adapted to transmit and receive at least one message using radio frequency transmissions.	The above contentions for claim 8 are hereby incorporated by reference. "A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	'217 patent, Figure 19.
10. The method of claim 8, further comprising providing at least one remote wireless communication device, wherein at least one of the devices has a unique address and the packet further comprises at least one scalable address field to contain the unique address for at least one device.	The above contentions for claim 8 are hereby incorporated by reference. "FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60. "In the preferred embodiment, the header information is approximately 65 bytes of information and the data bytes are approximately 8 bytes of information." '217 patent, 15:13-15. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header

	and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43.

	'252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network

	service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
11. The method of claim 8, further comprising providing an actuator associated with at least one of the remote devices, the actuator configured to actuate in response to the command code.	The above contention for claim 8 is hereby incorporated by reference. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
13. The method of claim 8, further comprising determining if an error exists in a packet of the at least one message.	The above contention for claim 8 is hereby incorporated by reference. "FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.
14. A wireless communication device for use in a communication system to communicate command and sensed data between remote wireless communication devices, the wireless communication device comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

a transceiver configured to send and receive wireless communications; and	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The sensor interface module is programed to set the unique identifier for the device and the frequency that it transmits to the

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	data collection module." '217 patent, 13:33-35. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to format a message comprising a receiver address comprising a scalable address of at least one remote wireless device; a command indicator comprising a command code, a data value comprising a scalable message.	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48.

	"d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent, Figure 19. "FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60. "In the preferred embodiment, the header information is approximately 65 bytes of information and the data bytes are approximately 8 bytes of information." '217 patent, 15:13-15. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S.

	Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248.

	U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51.

	U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable

	fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43.

	'252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is

	identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields.

	Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
15. The wireless communication device of claim 14, further comprising at least one sensor configured to detect a condition and output a signal to the controller.	The above contentions for claim 14 are hereby incorporated by reference. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The sensor interface module is programed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater

	module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
16. The wireless communication device of claim 14, wherein the controller is further configured to determine if at least one received message is a duplicate message and determine a location from which the duplicate message originated.	The above contentions for claim 14 are hereby incorporated by reference. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent, Figure 19.
17. The wireless communication device of claim 14, further comprising at least one actuator configured to implement an action corresponding to the command code.	The above contention for claim 14 is hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No.

	6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header

	and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248.

	U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51.

	U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

18. The device of claim 14, wherein the transceiver comprises a unique transceiver address to distinguish the transceiver from other transceivers.	The above contentions for claim 14 are hereby incorporated by reference. "The sensor interface module is programed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35.
19. In a system for communicating commands and sensed data between remote devices comprising a communications device for communicating commands and sensed data, the communications device comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a transceiver operably configured to be in communication with at least one other of a plurality of transceivers, wherein the transceiver has a unique address, wherein the unique address identities the individual transceiver, wherein the transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with each of the other transceivers via preformatted messages;	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "Sensor interface modules 102 communicate with data collection

	modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The sensor interface module is programed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
a controller configured to be in communication with the transceiver, the controller configured to provide preformatted messages for communication;	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent, Figure 19.
wherein the preformatted message comprises at least one packet, wherein the packet comprises: a receiver address comprising a scalable address of the at least one of the intended receiving transceivers; sender address comprising the unique address of the sending transceiver; a command indicator comprising a command code; at least one data value comprising a scalable message; and an error detector comprising a redundancy check error detector;	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

and wherein the controller is configured to interact with the transceiver to send preformatted command messages.	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent, Figure 19. "FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	"In the preferred embodiment, the header information is approximately 65 bytes of information and the data bytes are approximately 8 bytes of information." '217 patent, 15:13-15. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses:

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	"The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses:

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	"Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are

	supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
20. The communication device of claim 19, further comprising a sensor operatively configured to detect a condition and output a sensed data signal that corresponds to the condition to the transceiver.	The above contentions for claim 19 are hereby incorporated by reference. "Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor

	interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent, Figure 19. "FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60. "In the preferred embodiment, the header information is approximately 65 bytes of information and the data bytes are

	approximately 8 bytes of information." '217 patent, 15:13-15.
21. The communication device of claim 20, wherein the transceiver is configured to receive a preformatted command message requesting sensed data, confirms the receiver address is its own unique address, receives the sensed data signal, formats the sensed data signal into scalable byte segments, determines a number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet.	The above contentions for claim 20 are hereby incorporated by reference. "Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special

	requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-

	3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson:

	"FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in

	several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more

	commercialized and proposing extensions for IP addressing.
25. A wireless communication device for use in a communication system to communicate a number of commands and sensed data between remote wireless communication devices, the wireless communication device comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a transceiver configured to send and receive wireless communications; and	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface

	modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The sensor interface module is programed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to reformat a message comprising receiver address comprising a scalable address of at least one remote wireless device; a command indicator comprising a command code; a data value comprising a scalable message.	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29. "The sensor interface modules 102 are intelligent

	communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent, Figure 19. "FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	"In the preferred embodiment, the header information is approximately 65 bytes of information and the data bytes are approximately 8 bytes of information." '217 patent, 15:13-15. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. "Data repeater module processors communicate using SLIP encapsulated Internet Protocol (IP) datagrams. An IP datagram from a data collection module processor is sent to its router (via SLIP) for transport to the destination router and its data collection module processor. Only the 16-but Total Length and 32-bit

	Destination Address fields of an IP datagram are used by the router. The following shows the general IP protocol for data repeater module communications." '217 patent, 35:56-36:25 (including tables showing Destination Address). To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses:

	"The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data

	for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses:

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 6,366,217

	"Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are

	supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network

	service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that

	uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

The '661 Patent – Claim	U.S. Patent No. 6,366,217
1. A system for remote data collection, assembly, storage, and event detection and reporting, comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217, 4:54-66. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent

	out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
a plurality of transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way

	communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
at least one gateway connected to the wide area network configured to receive and translate the select information, the	"4. Transmitting Information to Host Module Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN.	concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

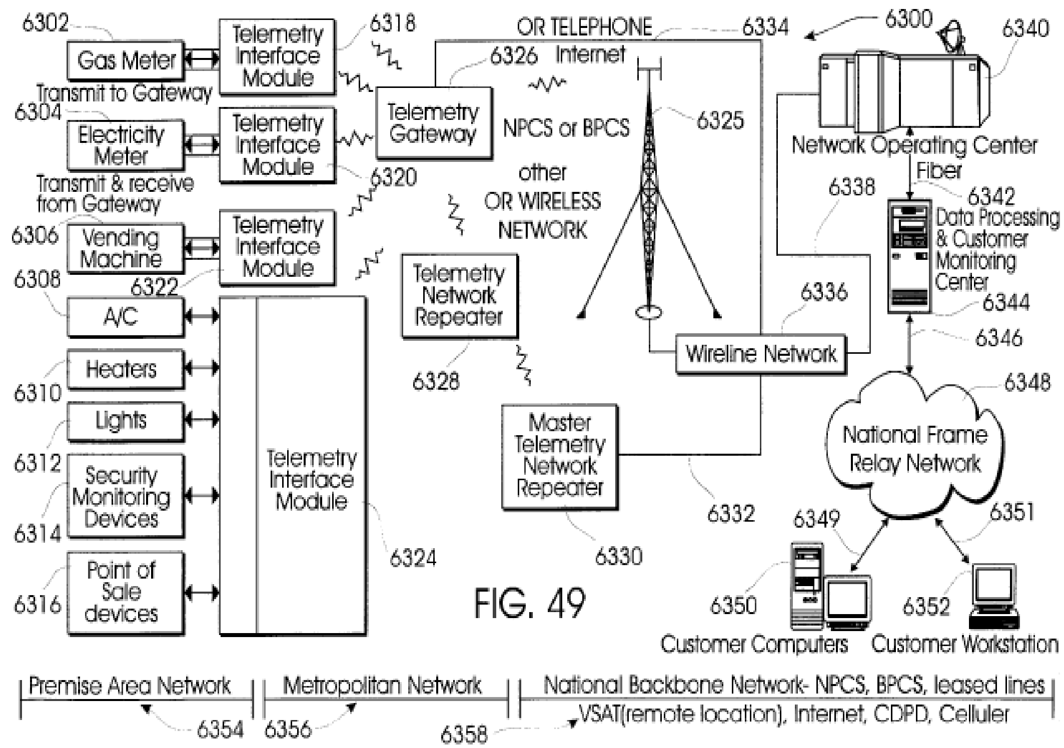
	 FIG. 49
5. A system for monitoring remote devices, comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

at least one sensor adapted to generate an electrical signal in response to a physical condition;	"Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

at least one wireless transmitter electrically interfaced with the sensor and configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a radio-frequency (RF) signal;	"Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9.
one or more additional wireless transmitters each electrically interfaced with a sensor and configured to receive the RF signal and	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

retransmit the RF signal;	interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41.
at least one gateway connected a wide area network (WAN) configured to receive and translate the retransmitted RF signal, the gateway further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN; and	"4. Transmitting Information to Host Module Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

	"IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

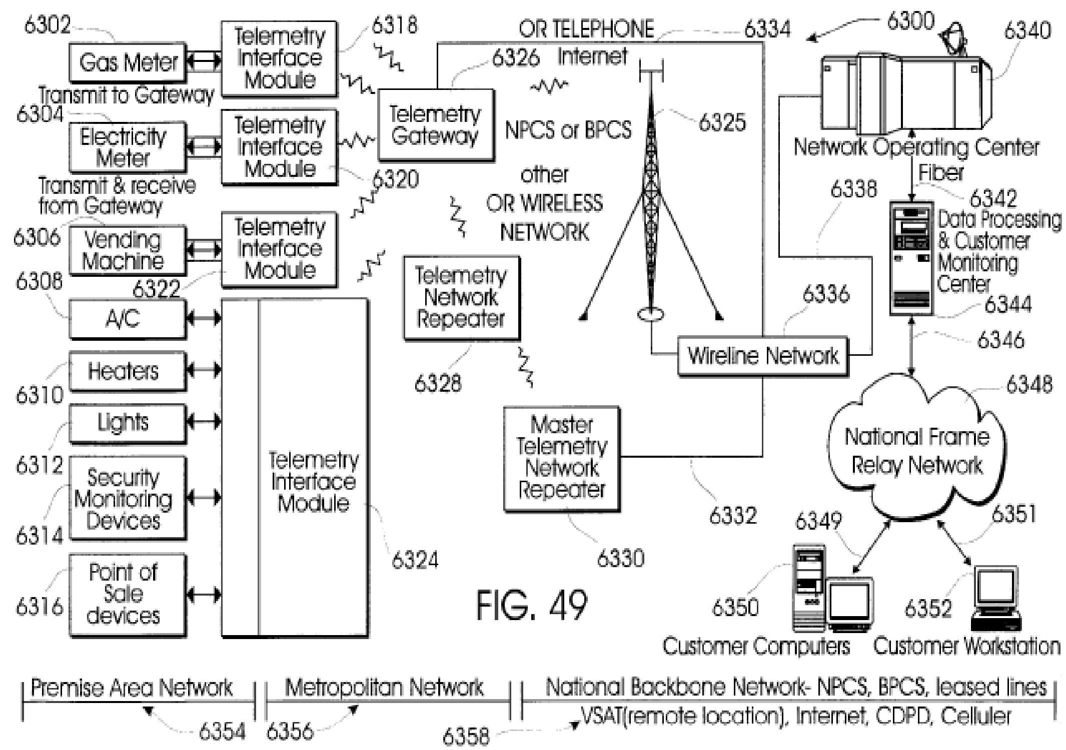
	 FIG. 49
a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.	"An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems."

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

	'217, 4:54-66. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
6. The system of claim 5, wherein the at least one gateway is permanently connected to the WAN.	The above contentions for claim 5 are hereby incorporated by reference. "An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217, 4:54-66.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

	"The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
8. The system of claim 5, wherein the gateway translates the encoded electrical signal, the transmitter identification and the transceiver identification information into TCP/IP for communication over the WAN.	The above contentions for claim 5 are hereby incorporated by reference. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
9. A system for controlling a remote device comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a target remote device having an actuator to be controlled;	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to

	control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
a computer configured to execute at least one computer program that generates at least one control signal responsive to a system input signal; said computer integrated with a wide area network (WAN);	"An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217, 4:54-66. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent

	out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
a gateway connected to the WAN configured to receive and translate the at least one control signal	"4. Transmitting Information to Host Module Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

<table>
<tr><td></td><td>out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module.” ‘217 patent, 46:11-16.

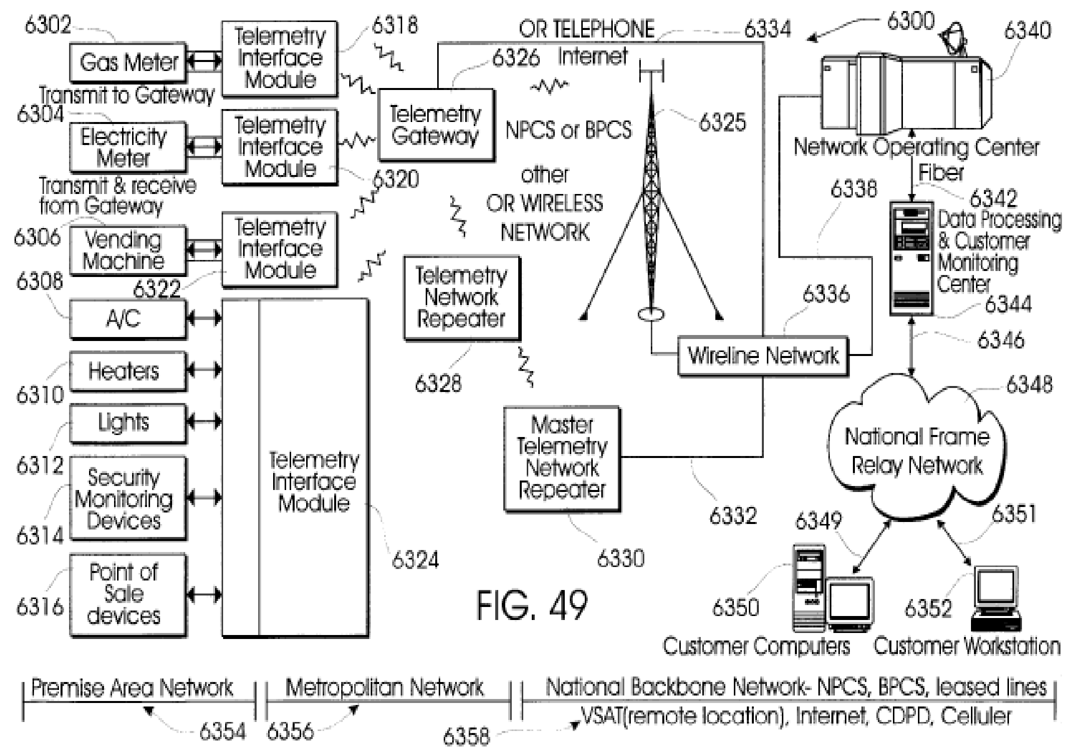

</td></tr>
<tr><td>a wireless transmitter coupled with the</td><td>“4. Transmitting Information to Host Module</td></tr>
</table>

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

gateway for transmitting a wireless signal that contains the control signal;	Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"),

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

	U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

	U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

	U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a first wireless transceiver electrically interfaced with an actuator for receiving the wireless signal and further retransmitting the wireless signal to the target remote device; and	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.

logic coupled to the target remote device for extracting the control signal from the retransmitted wireless signal and imparting an action on the actuator in response to the extracted control signal.	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses:

	"PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the

	factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data

	and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
10. The system of claim 9, further comprising:	The above contentions for claim 9 are hereby incorporated by reference.
a plurality of additional wireless transceivers each coupled to an actuator and configured to receive the wireless signal and to retransmit the wireless signal, wherein one of the plurality of additional wireless transceivers receive the wireless signal from the wireless transmitter and another one of the plurality of the additional wireless transceivers retransmits the wireless signal to the first wireless transceiver.	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

	processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
11. The system of claim 9, further comprising:	The above contentions for claim 9 are hereby incorporated by reference.
a plurality of additional wireless transceivers each coupled to an actuator or a sensor and configured to receive the wireless signal and to retransmit the wireless signal, wherein one of the plurality of additional wireless transceivers receive the wireless signal from the wireless transmitter and another one of the plurality of the additional wireless transceivers retransmits the wireless signal to the first wireless transceiver.	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
12. A system for remote data collection, assembly, storage, and event detection and	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor

reporting, comprising:	interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217, 4:54-66. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other

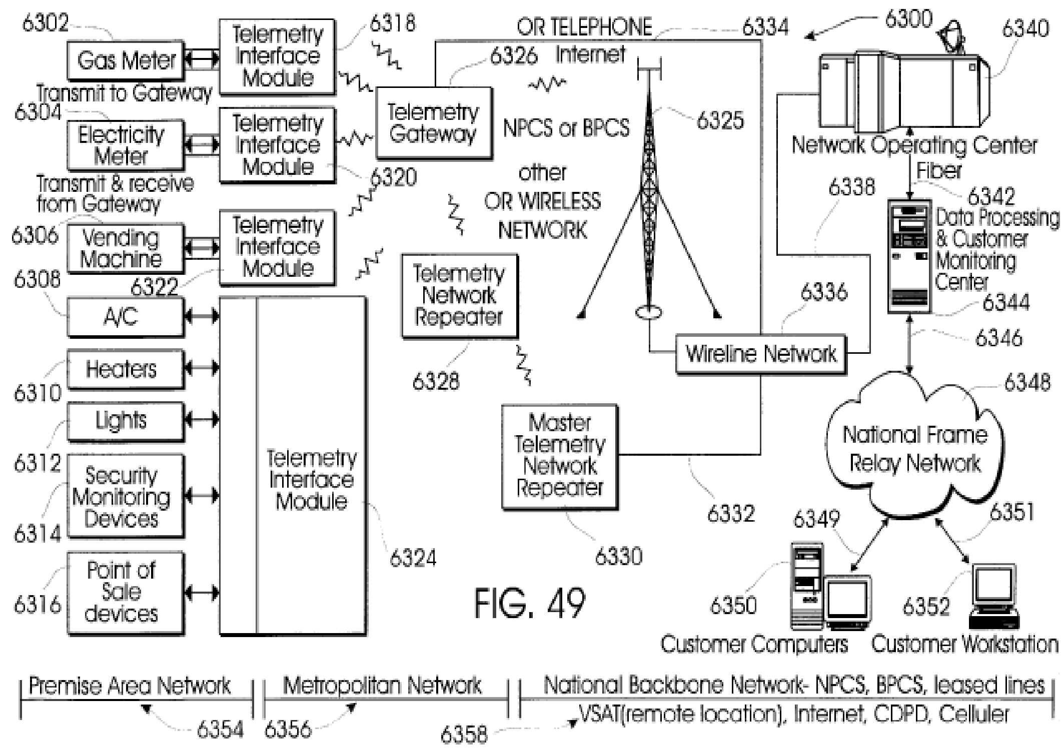
	module." '217 patent, 46:11-16.
a plurality of non-earth orbiting transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

	"Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer	"4. Transmitting Information to Host Module Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by

over the WAN.	means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 6,366,217

	 FIG. 49
14. The system as defined claim 12, wherein the gateway translates the encoded electrical signal, the transmitter identification, and the transceiver identification information into TCP/IP for communication over the WAN.	The above contentions for claim 12 are hereby incorporated by reference. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other

	module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

The '692 Patent – Claim	U.S. Patent No. 6,366,217
1. A system for remote data collection, assembly, and storage comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"The data collection module will gather the information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217 patent, 4:62-66. "2. The Data Collection Module a.. Overview The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for a RF signal modulated with a particular format. Once a valid signal is identified, the receiver

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	stops hopping and decodes the entire data packet which is passes along CPU module for collection and evaluation." '217 patent, 18:45-55. "The data collection module 110 is a local, intelligent, data concentrator residing at or near the location of the sensor interface modules 102. The data collection module 110 act as the focal point of all the information that is collected from the sensor interface modules 102 within a monitored area such as a customer's premises and transmits this information to the host module 122 over standard communication systems 118." '217 patent, 19:17-23. "Information from the sensor interface module 102 is decoded and process in the data collection module 110 and prepared for transmission to the host module 122. The processor dynamically builds a table that stores the information received from each interface module. Information is grouped by the unique identifier assigned to each individual sensor interface module." '217 patent, 31:11-17. "An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217, 4:54-66. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102

	communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
at least one wireless transmitter configured to transmit select information and transmitter identification information;	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water

	systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is

	generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
a plurality of relatively low-power radio-frequency (RF) transceivers dispersed geographically at defined locations configured to receive select information transmitted from at least one nearby wireless transmitter and further configured to transmit the select information, the transmitter identification information and transceiver identification information; and	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1.

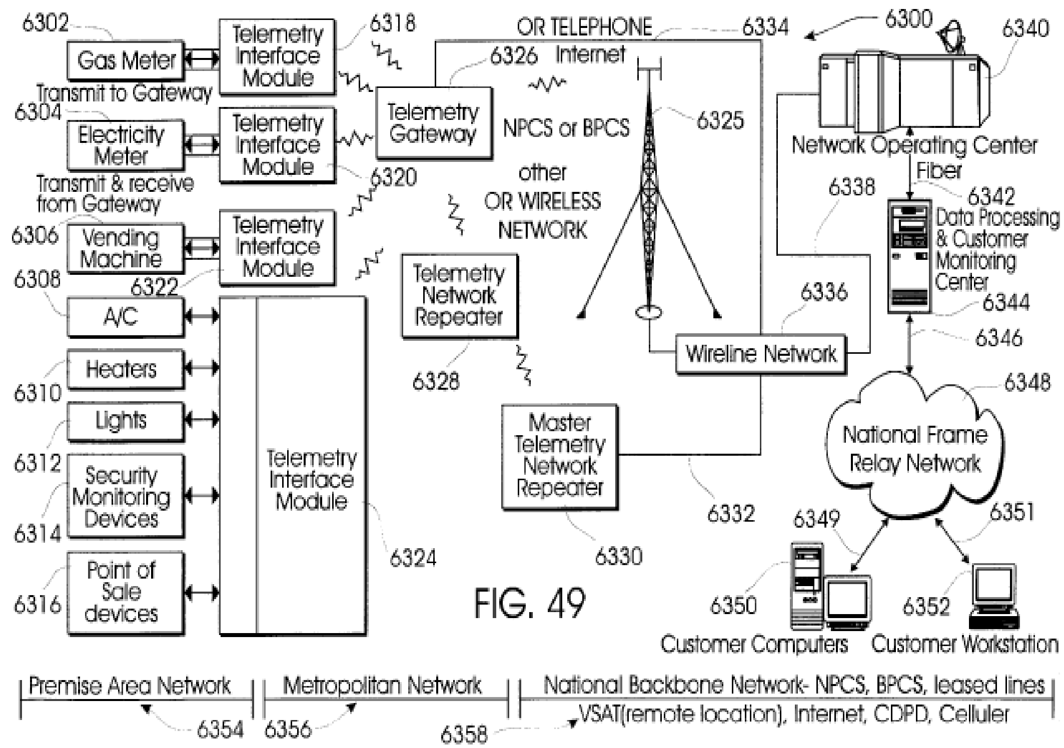
	"Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way

	transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
at least one gateway connected to the wide area network configured to receive and	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present

translate the select information, the transmitter identification information, and transceiver identification information, said gateway further configured to farther transmit the translated information to the computer over the WAN.	invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65.

	"The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	 FIG. 49
3. The system as defined in claim 1, wherein each wireless transmitter is configured to transmit a relatively low-power, radio-frequency (RF) signal.	The above contentions for claim 1 are hereby incorporated by reference. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse

	encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30.

	"The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
4. The system as defined in claim 1, wherein each wireless transmitter is integrated with a sensor.	The above contentions for claim 1 are hereby incorporated by reference. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19.
5. The system as defined in claim 1, wherein the RF signal transmitted by the receiver contains a concatenation of information comprising select information and transmitter identification information from the originating transmitter and transceiver identification information for each transceiver that receives and repeats the RF signal.	The above contentions for claim 1 are hereby incorporated by reference. "FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and CRC. The header information includes a preamble and a sensor interface module identifier. The preamble is designed to distinguish the transmitted information from spurious radio signals or background noise. The identifier information is designed to identify the specific sensor interface module's transmission that is being received, and to identify any other type of information such as meter-type, count-type or other information specific the device being monitored. The information signal contains the data collected by the sensor interface module." '217 patent, 13:57-67. "As shown in FIG. 21, information is transmitted in a 32 bit address and information packet to the data collection module. This 32 bit packet includes the sensor interface module's identification and the transmitted information. As shown in FIG. 21, the signal 1450 transmitted from the sensor interface module 102 consists of several sub-components. The sub-components include synchronization flags 1452, synchronization byte 1454, address 1456, input status 1458, counter 1460, and CRC bytes 1462. … The address 1456 is a 32-bit or 4-byte sensor interface module address which is transmitted to the data collection module 110." '217 patent, 14:3-18. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38.

	"The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
6. The system as defined in claim 5, wherein the at least one transmitter is replaced by a transceiver, the transceiver further integrated with an actuator.	The above contentions for claim 5 are hereby incorporated by reference. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules

	designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	'217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
7. The system as defined in claim 6, wherein the transceivers are configured to communicate with the gateway via a RF	The above contentions for claim 6 are hereby incorporated by reference. "d. Sensor Interface Main Body

signal.	FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9.
8. The system as defined in claim 7, wherein the computer is further configured to respond to received select information by communicating a control signal to at least one	The above contentions for claim 7 are hereby incorporated by reference. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

transceiver, wherein the actuator integrated with the transceiver is responsive to the control signal.	102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9.
11. The system as defined in claim 1, wherein the gateway includes one selected from the group consisting of:	The above contentions for claim 1 are hereby incorporated by reference.
a modem for establishing a dial-up connection with a remote computer; a network card for communicating across a local area network; a network card for communicating across the WAN, a DSL modem; and an ISDN card to permit backup access to the computer.	"The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

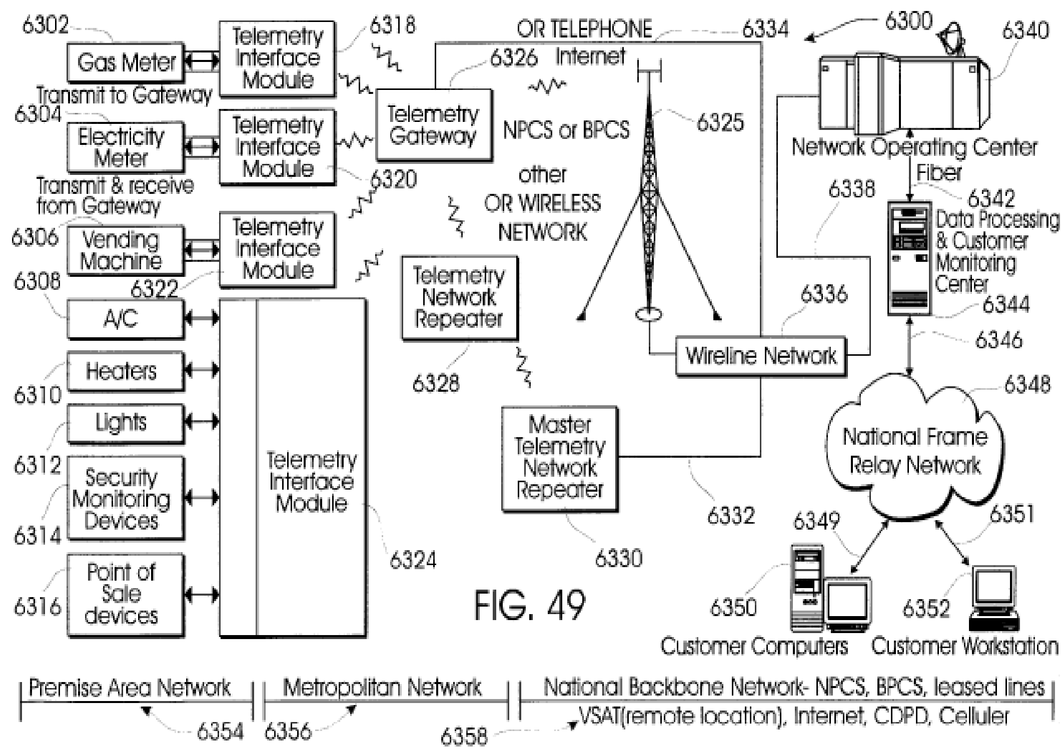
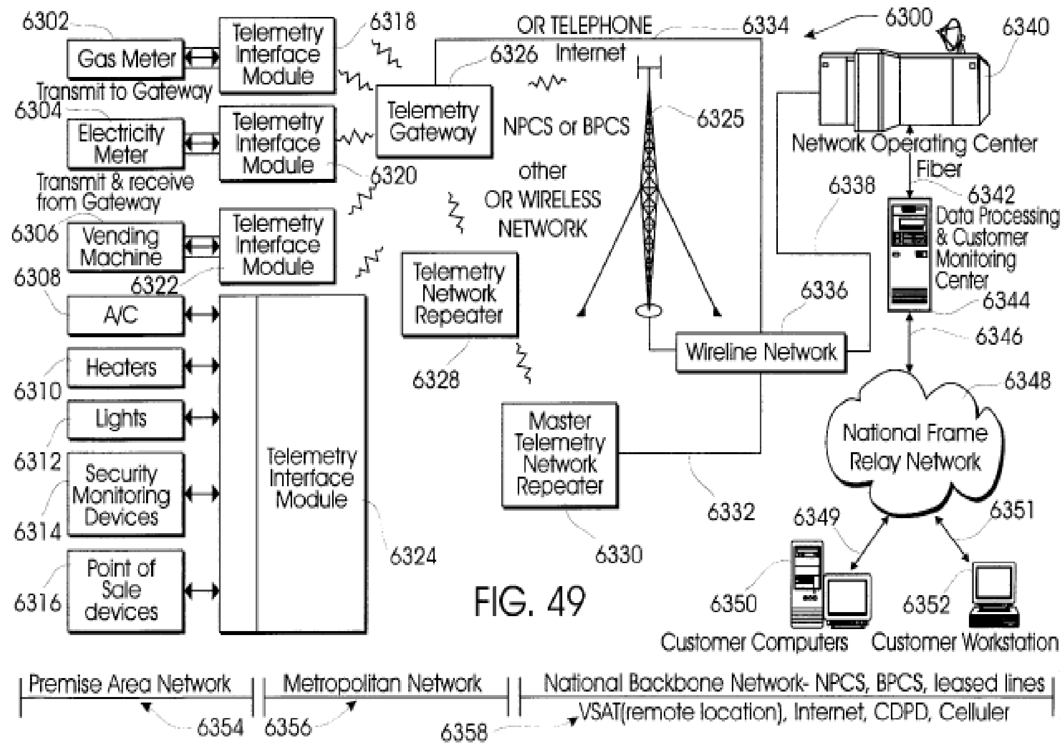
	 FIG. 49
12. The system as defined in claim 1, wherein the gateway translates the select information, the transmitter identification, and the transceiver identification information to TCP/IP for communication over the WAN.	The above contentions for claim 1 are hereby incorporated by reference. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	module." '217 patent, 46:11-16.  FIG. 49 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example:

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The

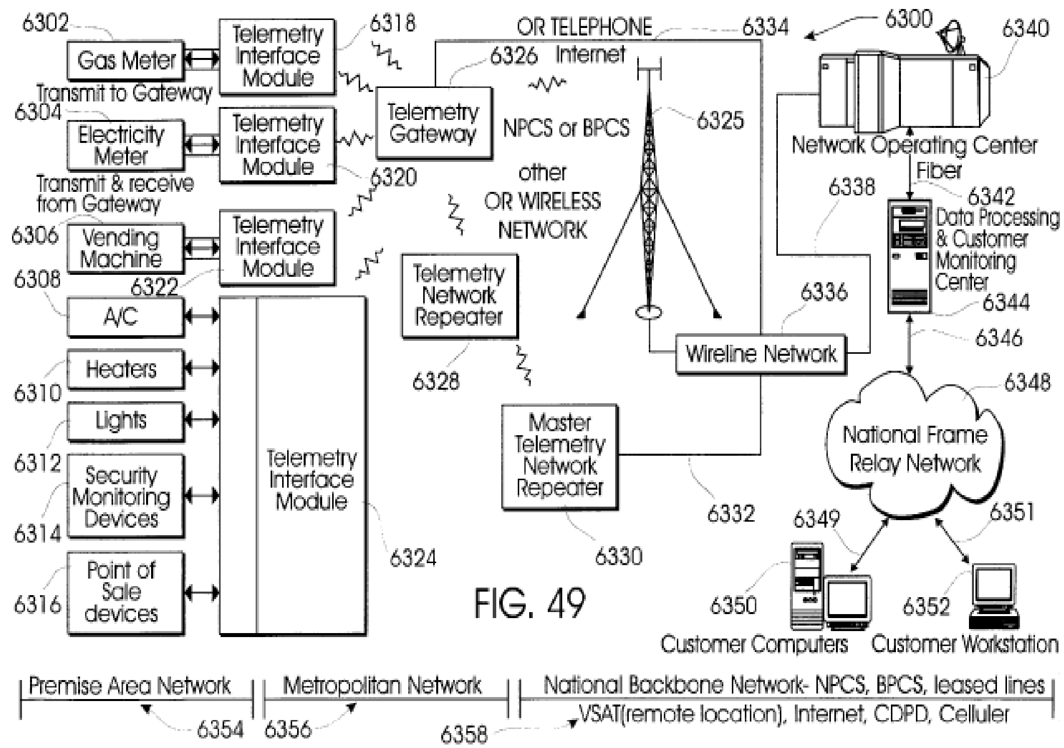
Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
13. The system as defined in claim 1, wherein the WAN is the Internet.	The above contentions for claim 1 are hereby incorporated by reference. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	 FIG. 49 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.

	Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks.…" Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

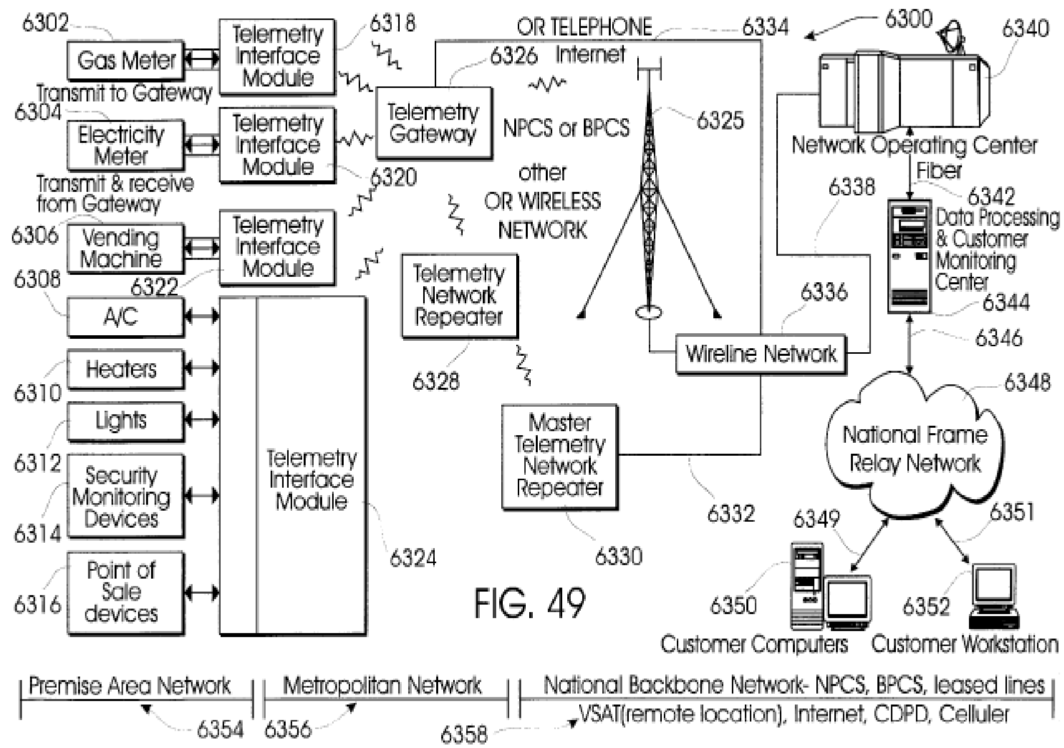
	which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

14. The system as defined in claim 1, wherein the WAN is a dedicated Intranet.	The above contentions for claim 1 are hereby incorporated by reference. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. …

	2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘650 patent discloses: “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art.” ‘650 patent, 6:11-26. “Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers.” ‘650 patent, 8:42-44.

	"For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	 FIG. 49
24. A method for controlling a system comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-

	area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1.
remotely collecting data from at least one sensor;	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	"d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to

	receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
processing the data into a radio-frequency (RF) signal;	"d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different

	sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a

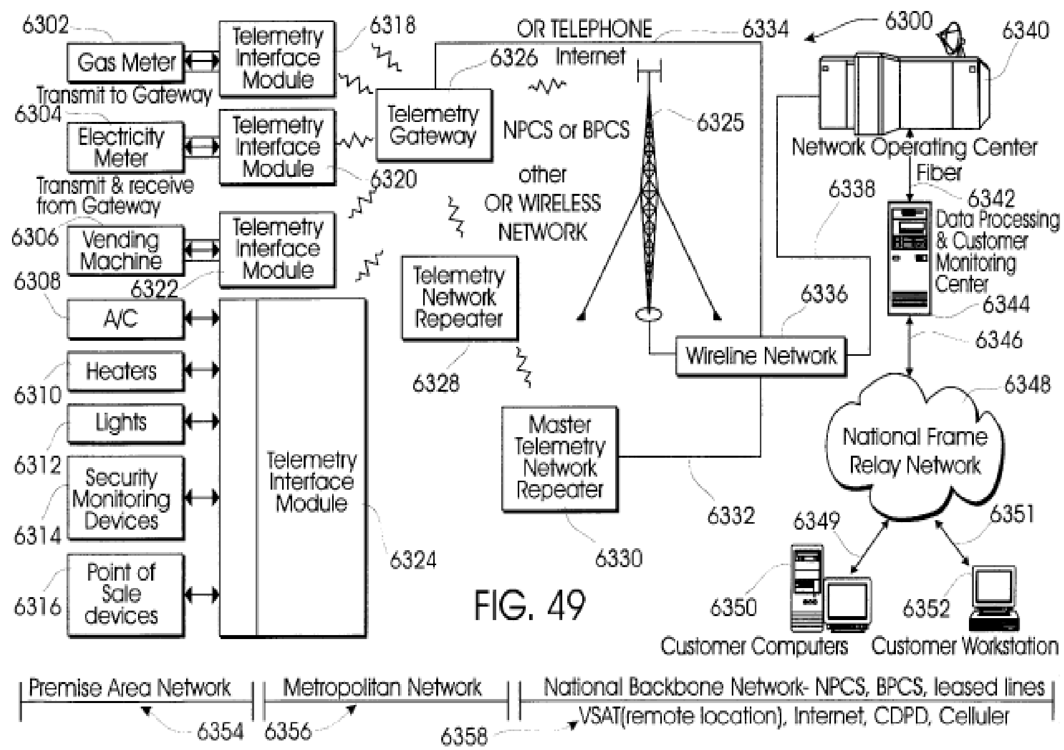
	processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
transmitting the RF signal, via a relatively low-power transceiver, to a gateway;	"d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	"FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
translating the data in the RF signal into a network transfer protocol;	"Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by

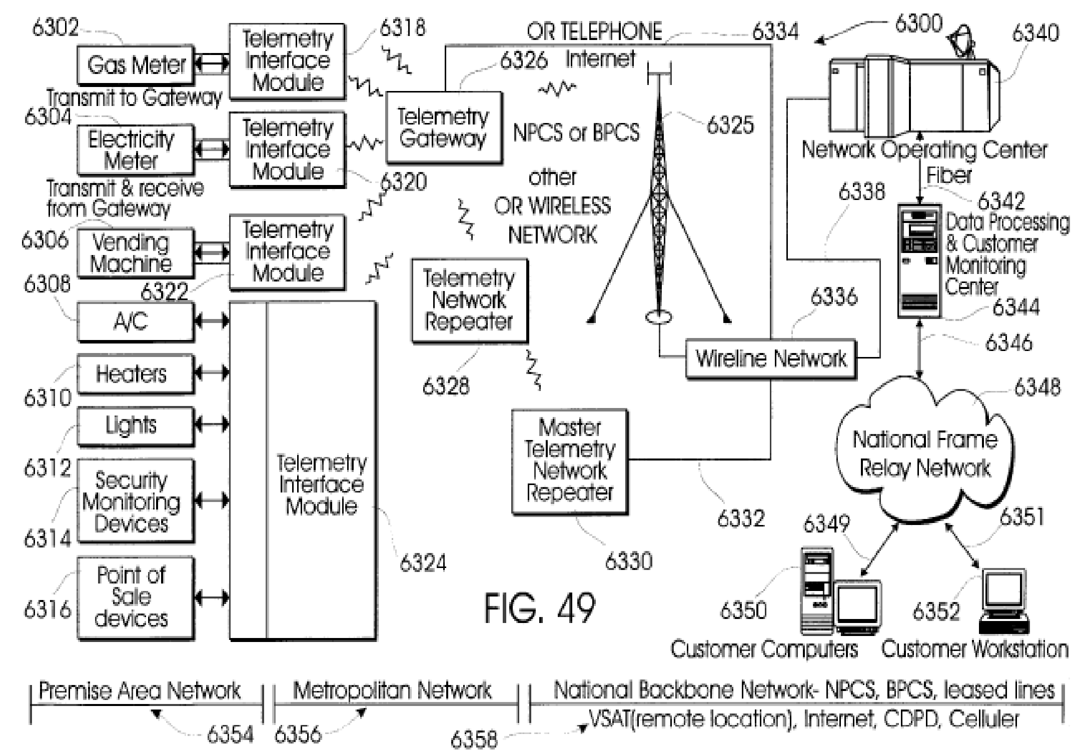
	means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	
sending the translated data to a computer, wherein the computer is configured to appropriately respond to the data generated by the at least one sensor by generating an appropriate control signal;	"Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband

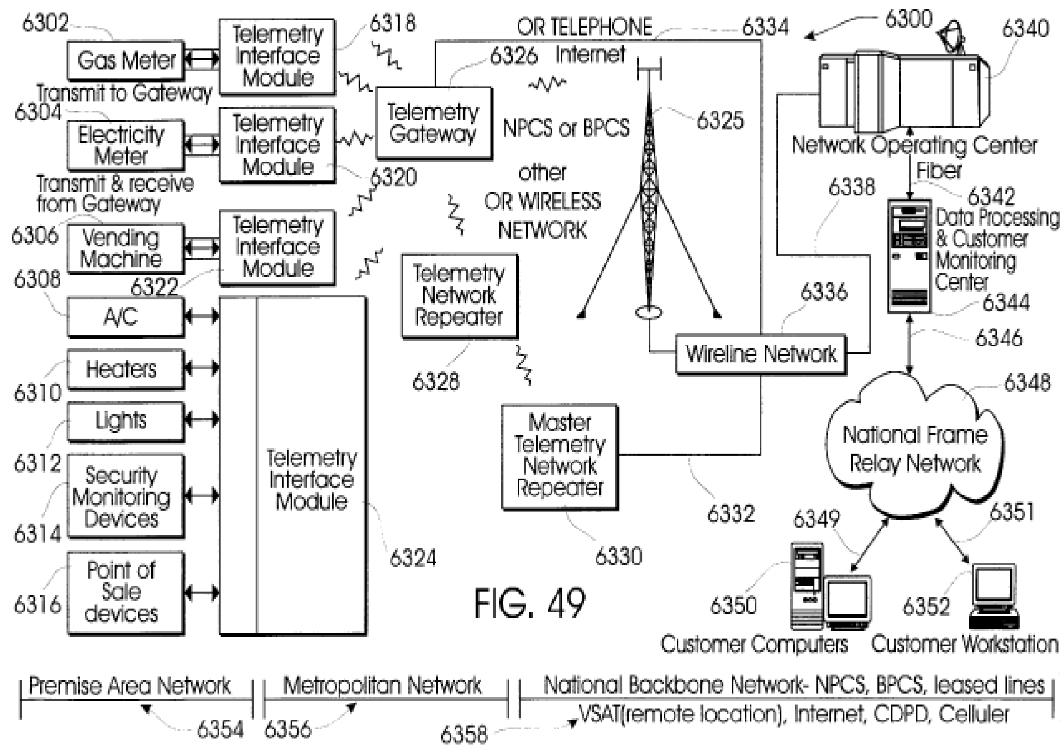
	PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	
sending the control signal via the network to the gateway,	"Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband

	PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

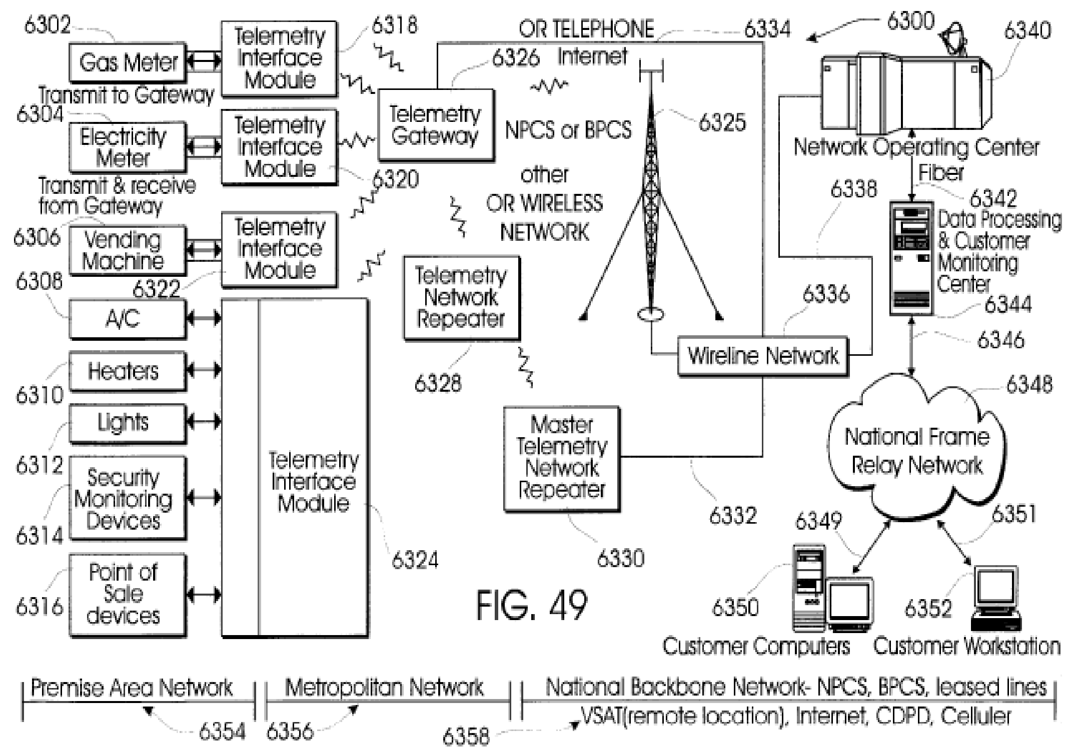
Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

<table>
<tr><td></td><td>


</td></tr>
<tr><td>translating the control signal from a network transfer protocol into an RF control signal;</td><td>“Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband</td></tr>
</table>

	PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	 FIG. 49
transmitting the RF control signal;	"Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband

	PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

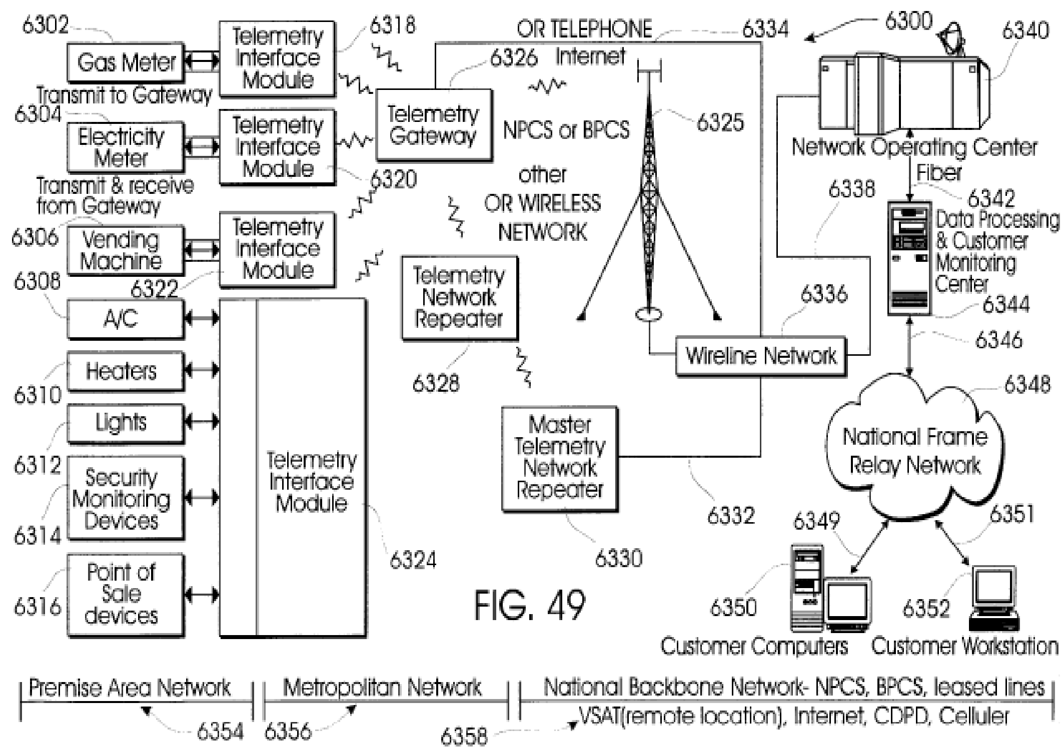
	
receiving the RF control signal;	"The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

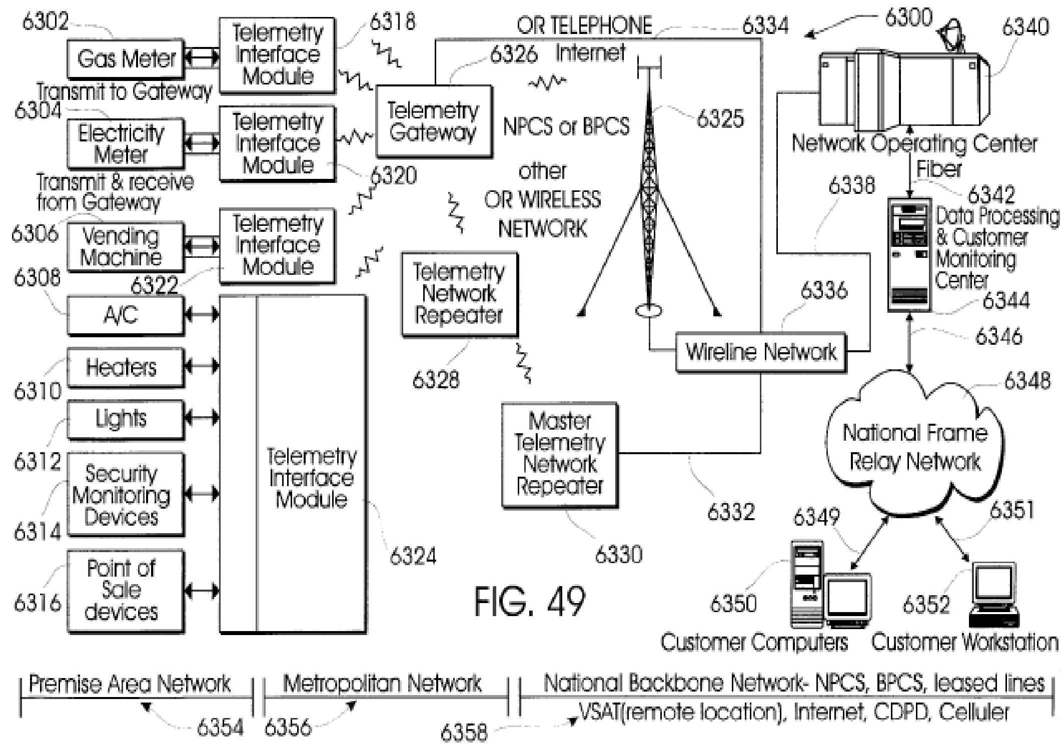
<table>
<tr><td></td><td>

FIG. 49</td></tr>
<tr><td>translating the received RF control signal into an analog signal; and</td><td>“5. Device Adjustment Modules
Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing</td></tr>
</table>

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
applying the analog signal to an actuator to effect the desired system response.	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
25. The method of claim 24, wherein the RF signal contains a concatenation of information comprising encoded data information and transmitter identification information from an originating transmitter.	The above contentions for claim 24 are hereby incorporated by reference. "FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and CRC. The header information includes a preamble and a sensor interface module identifier. The preamble is designed to distinguish the transmitted information from spurious radio signals or background noise. The identifier information is designed to identify the specific sensor interface module's transmission that is being received, and to identify any other type of information such as meter-type, count-type or other information specific the device being monitored. The information signal contains the data collected by the sensor interface module." '217 patent, 13:57-67.

	"As shown in FIG. 21, information is transmitted in a 32 bit address and information packet to the data collection module. This 32 bit packet includes the sensor interface module's identification and the transmitted information. As shown in FIG. 21, the signal 1450 transmitted from the sensor interface module 102 consists of several sub-components. The sub-components include synchronization flags 1452, synchronization byte 1454, address 1456, input status 1458, counter 1460, and CRC bytes 1462. … The address 1456 is a 32-bit or 4-byte sensor interface module address which is transmitted to the data collection module 110." '217 patent, 14:3-18. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

26. The method of claim 25, wherein the step of transmitting the RF signal is further performed by at least one transceiver, wherein the transceiver is configured to concatenate a transceiver identification code to the RF signal.	The above contentions for claim 25 are hereby incorporated by reference. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes

	housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. To the extent that Plaintiffs contend that this claim limitation is not disclosed

	explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
27. The method of claim 25, wherein the step of transmitting the RF control signal is further performed by at least one transceiver, wherein the transceiver is configured to receive and transmit the RF control signal.	The above contentions for claim 25 are hereby incorporated by reference. d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
28. The method of claim 25, wherein the steps of translating and applying the received RF	The above contentions for claim 25 are hereby incorporated by reference.

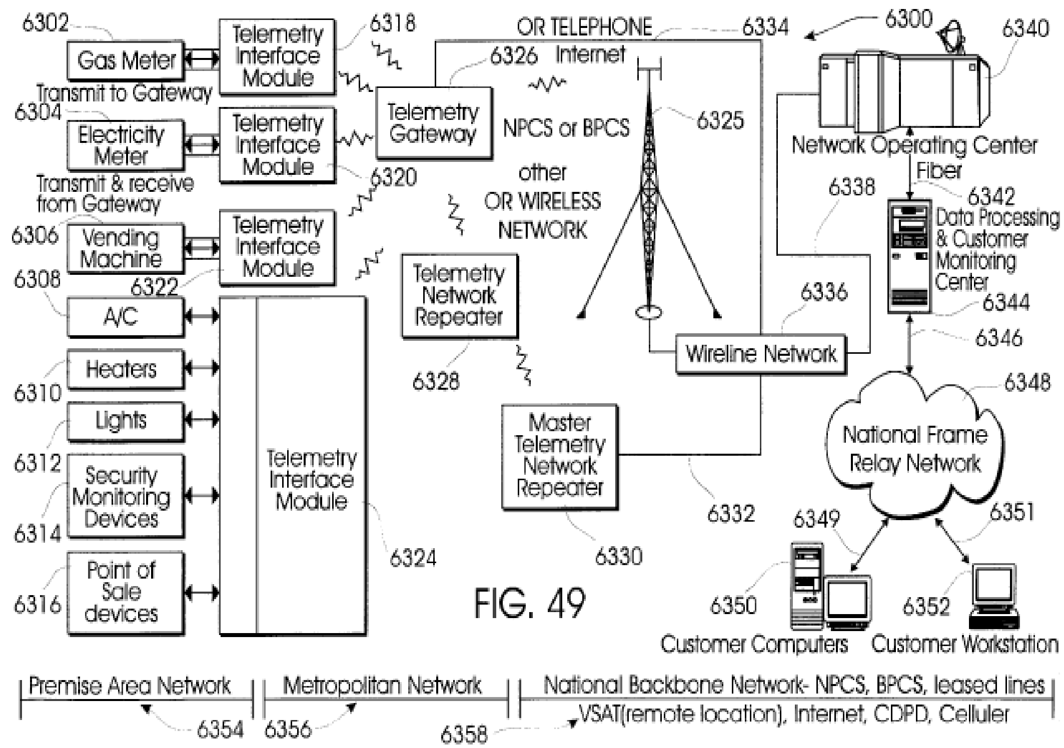
control signal are performed only by an identified transceiver electrically integrated with an actuator.	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
29. The method of claim 25, wherein the network is the Internet.	The above contentions for claim 25 are hereby incorporated by reference. "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host

	module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250.

	"Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries

	and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	
30. The method of claim 25, wherein the network is an Intranet.	The above contentions for claim 25 are hereby incorporated by reference. "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the

	host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

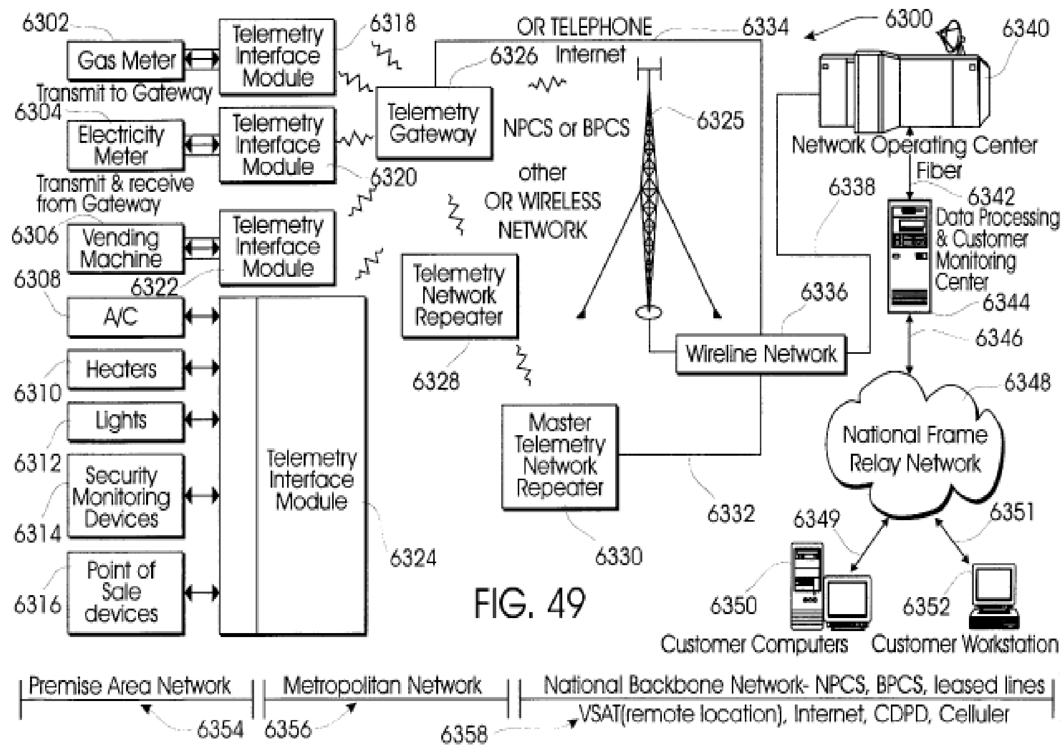
	 FIG. 49
31. The method of claim 25, wherein the network transfer protocol is TCP/IP.	The above contentions for claim 25 are hereby incorporated by reference. “Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol

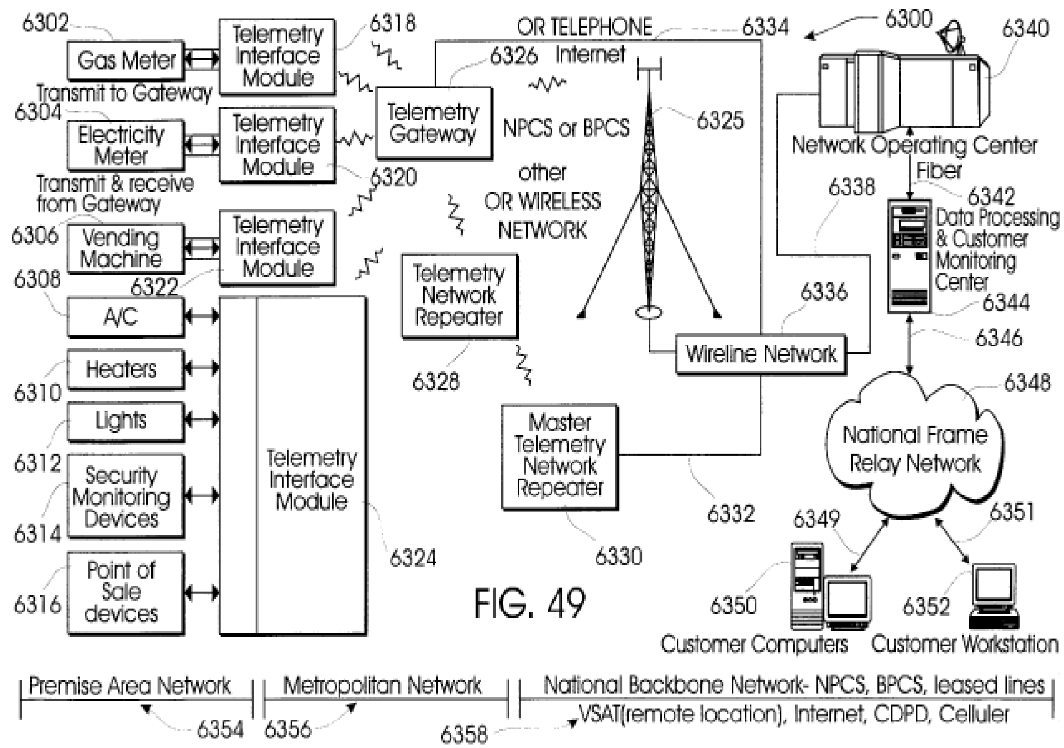
Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘650 patent discloses: “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art.” ‘650 patent, 6:11-26.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	"Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	
32. A system for monitoring remote devices comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.

	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1.
at least one sensor adapted to generate an electrical signal in response to a physical condition;	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43.

	"d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
at least one wireless transmitter configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a low-power radio-frequency (RF) signal;	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110

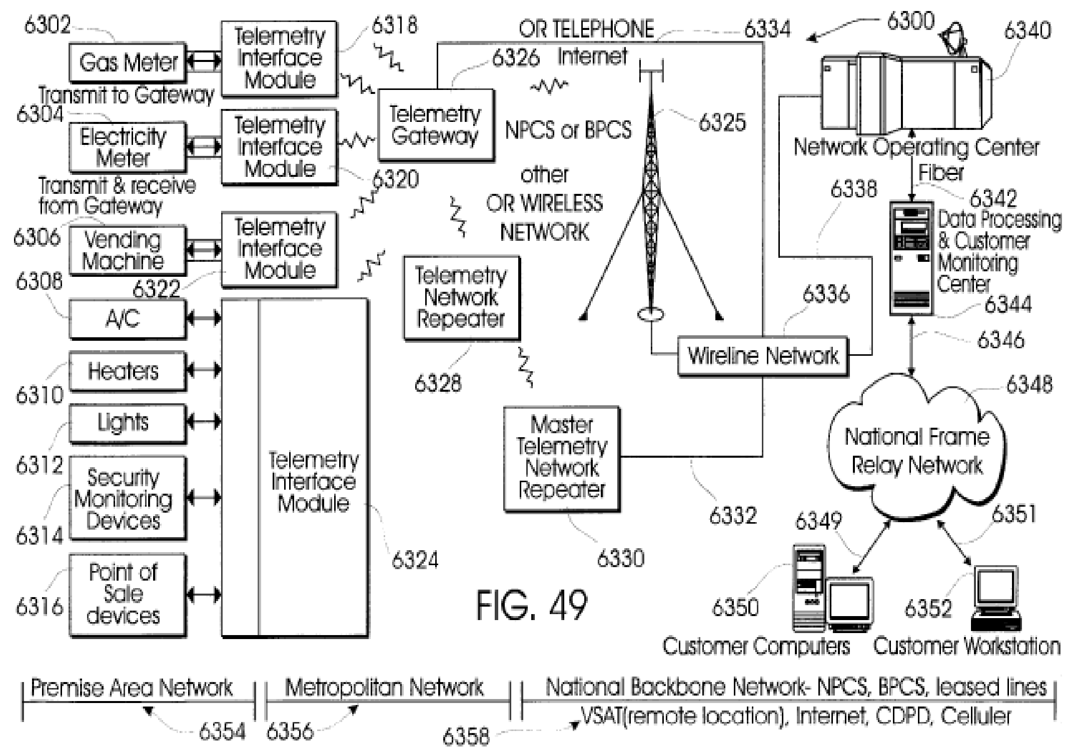
Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5.

	"Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
at least one gateway connected a wide area network (WAN) configured to receive and translate the RF signal, the gateway further configured to deliver the encoded electrical	"4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

signal and transmitter identification information to a computer on the WAN; and	information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

	 FIG. 49
a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.	"The data collection module will gather the information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217 patent, 4:62-66. "2. The Data Collection Module a.. Overview The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are

	received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for a RF signal modulated with a particular format. Once a valid signal is identified, the receiver stops hopping and decodes the entire data packet which is passes along CPU module for collection and evaluation." '217 patent, 18:45-55. "The data collection module 110 is a local, intelligent, data concentrator residing at or near the location of the sensor interface modules 102. The data collection module 110 act as the focal point of all the information that is collected from the sensor interface modules 102 within a monitored area such as a customer's premises and transmits this information to the host module 122 over standard communication systems 118." '217 patent, 19:17-23. "Information from the sensor interface module 102 is decoded and process in the data collection module 110 and prepared for transmission to the host module 122. The processor dynamically builds a table that stores the information received from each interface module. Information is grouped by the unique identifier assigned to each individual sensor interface module." '217 patent, 31:11-17. "An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217, 4:54-66. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-

	area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
34. The system defined in claim 32, wherein each wireless transmitter is configured to transmit a relatively low-power radio-	The above contentions for claim 32 are hereby incorporated by reference. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The

frequency (RF) signal.	basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9.

	"FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
36. The system defined in claim 32, wherein the gateway translates the encoded electrical signal, the transmitter identification, and the transceiver identification information into TCP/IP for communicating over the WAN.	The above contentions for claim 32 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

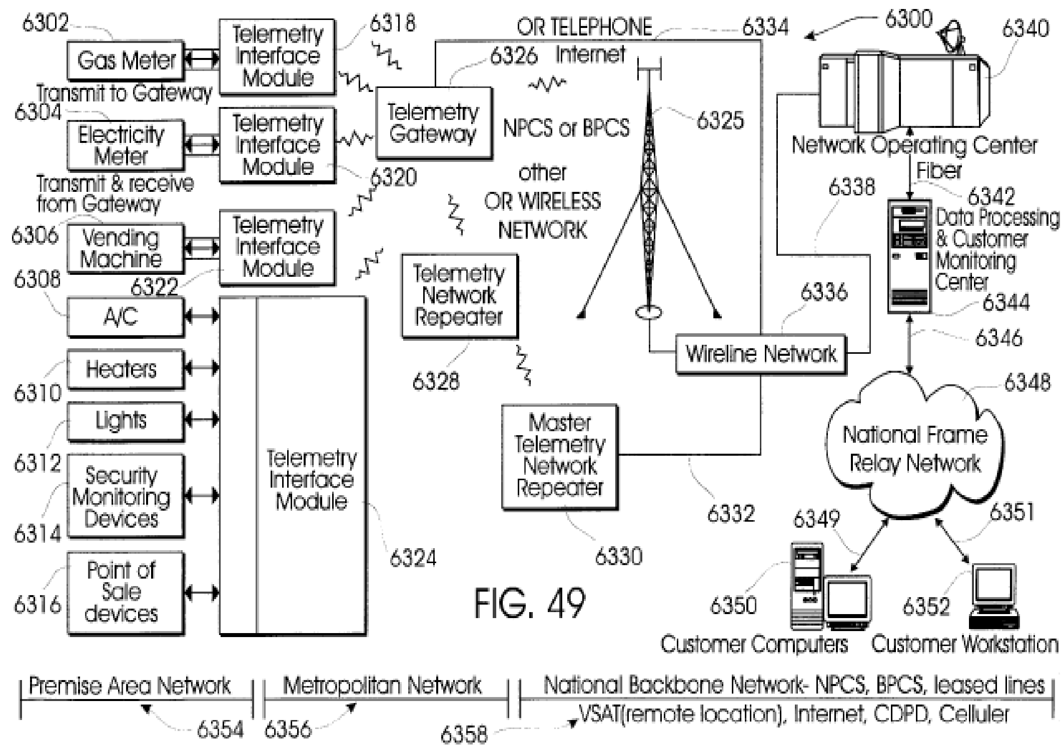
	 FIG. 49 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway."

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also

	illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

37. The system defined in claim 32, wherein the WAN in the Internet.	The above contentions for claim 32 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

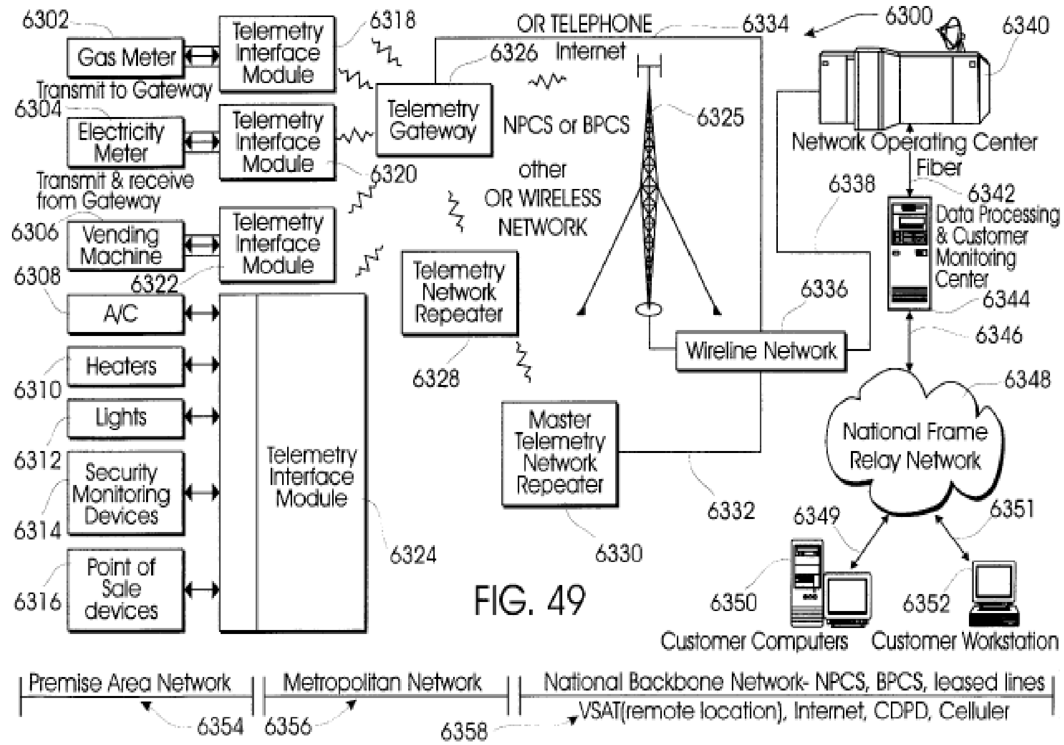
	out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.  FIG. 49 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses:

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However,

	some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for

	communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
38. The system defined in claim 32, wherein the WAN is a dedicated Intranet.	The above contentions for claim 32 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

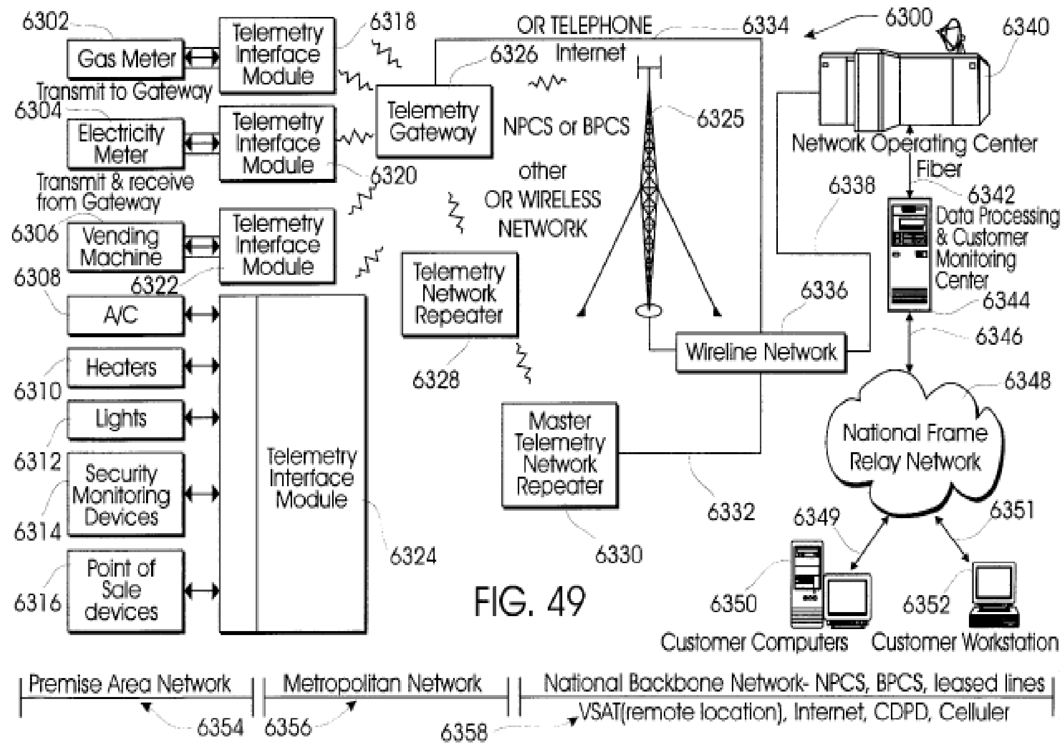
	The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.  FIG. 49
42. A system for controlling remote devices comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1.
a computer configured to execute at least one computer program that generates at least one control signal responsive to a system input signal; said computer integrated with a wide area network (WAN);	"4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38.

	"The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

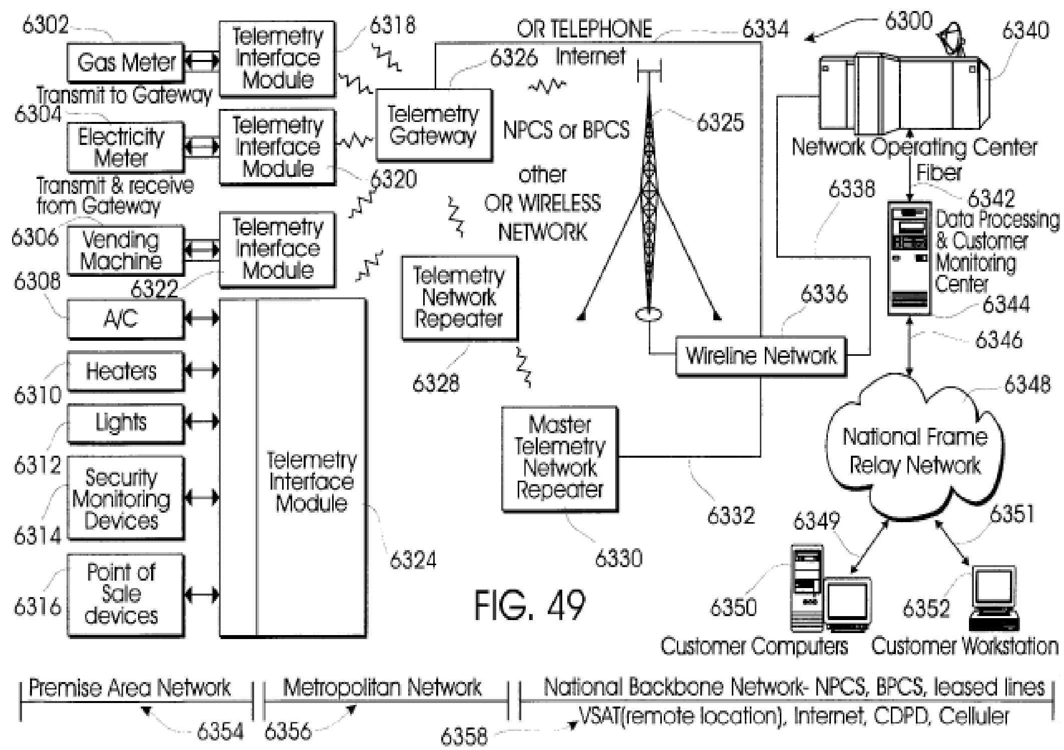
	 FIG. 49 "The data collection module will gather the information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217 patent, 4:62-66. "2. The Data Collection Module a.. Overview The data collection module boxes are weatherproof enclosures that house data

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for a RF signal modulated with a particular format. Once a valid signal is identified, the receiver stops hopping and decodes the entire data packet which is passes along CPU module for collection and evaluation." '217 patent, 18:45-55. "The data collection module 110 is a local, intelligent, data concentrator residing at or near the location of the sensor interface modules 102. The data collection module 110 act as the focal point of all the information that is collected from the sensor interface modules 102 within a monitored area such as a customer's premises and transmits this information to the host module 122 over standard communication systems 118." '217 patent, 19:17-23. "Information from the sensor interface module 102 is decoded and process in the data collection module 110 and prepared for transmission to the host module 122. The processor dynamically builds a table that stores the information received from each interface module. Information is grouped by the unique identifier assigned to each individual sensor interface module." '217 patent, 31:11-17. "An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217, 4:54-66.

	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22.
at least one gateway connected to the WAN configured to receive and translate the at least one control signal; said gateway further configured to transmit a radio-frequency (RF) signal containing the control signal and destination information;	"4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

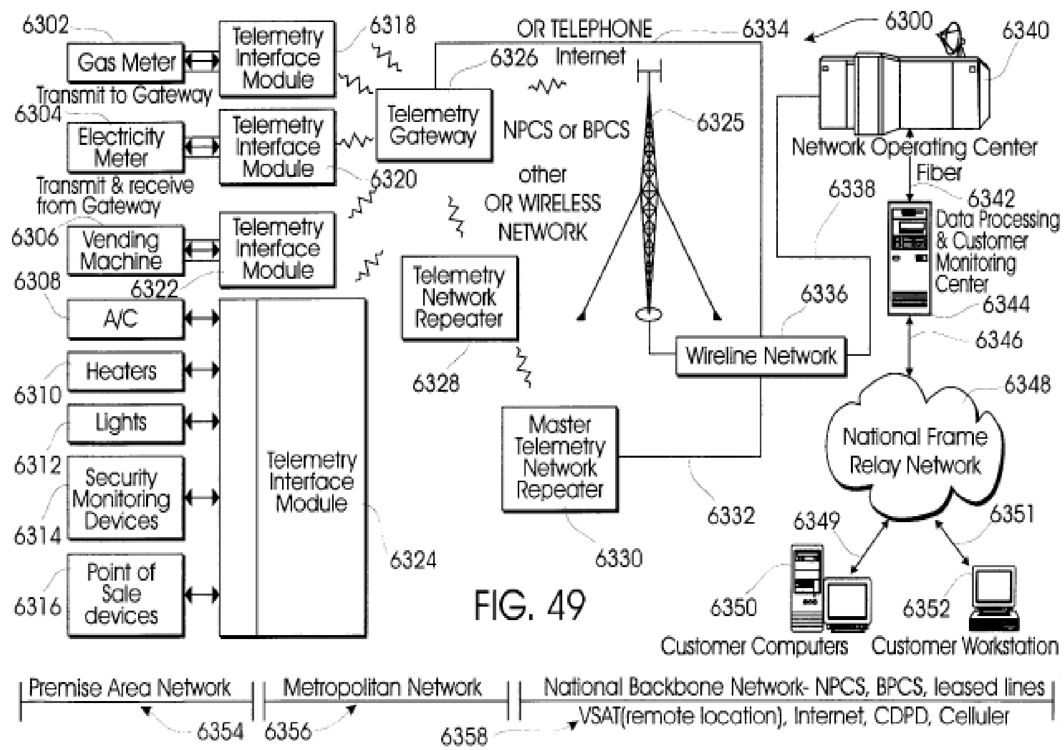
	"The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. 

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

at least one wireless low-power RF transceiver configured to receive the RF signal from the gateway; said wireless transceiver configured to translate the RF signal to an analog output signal, the wireless transceiver electrically coupled with an actuator; and	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio

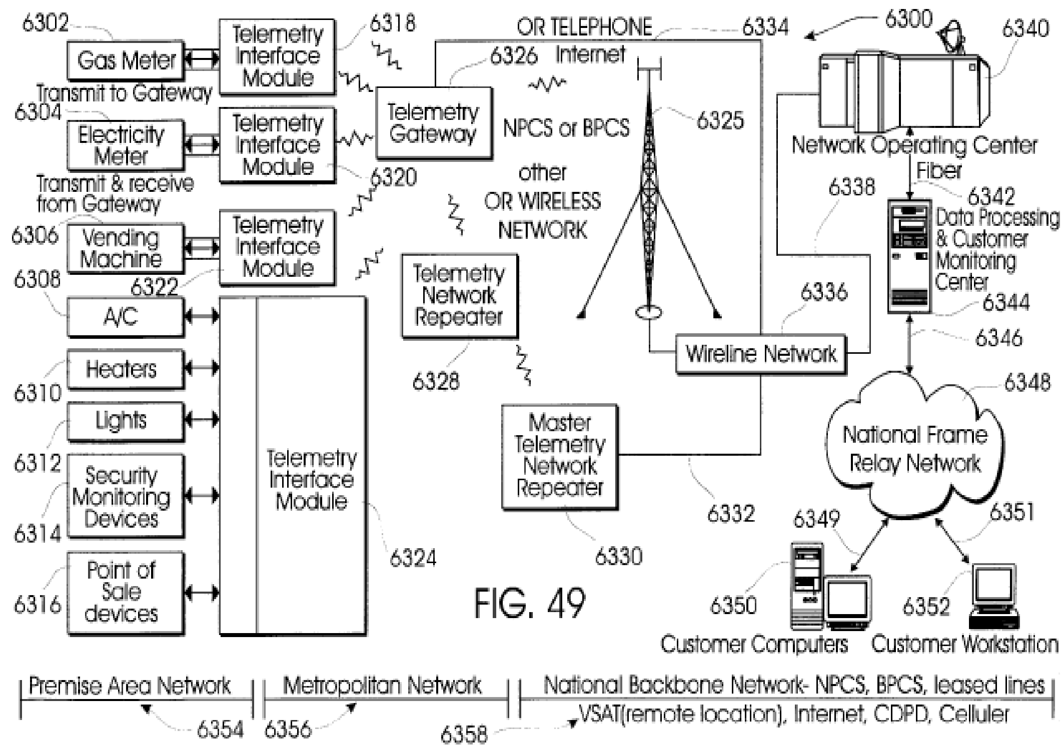
	frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection

	module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
an actuator configured to receive the analog output signal from the wireless transceiver, the actuator further configured to translate the analog output signal into a response.	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
43. The system defined in claim 42, the system input signal comprising:	The above contentions for claim 42 are hereby incorporated by reference.
a concatenation of information including data from a sensor, transceiver identification information from the originating transceiver, and transceiver identification information for	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and CRC. The header information includes a preamble and a sensor interface module identifier. The preamble is designed to distinguish the transmitted information from spurious radio signals or background

each transceiver that receives and repeats the RF signal.	noise. The identifier information is designed to identify the specific sensor interface module's transmission that is being received, and to identify any other type of information such as meter-type, count-type or other information specific the device being monitored. The information signal contains the data collected by the sensor interface module." '217 patent, 13:57-67. "As shown in FIG. 21, information is transmitted in a 32 bit address and information packet to the data collection module. This 32 bit packet includes the sensor interface module's identification and the transmitted information. As shown in FIG. 21, the signal 1450 transmitted from the sensor interface module 102 consists of several sub-components. The sub-components include synchronization flags 1452, synchronization byte 1454, address 1456, input status 1458, counter 1460, and CRC bytes 1462. … The address 1456 is a 32-bit or 4-byte sensor interface module address which is transmitted to the data collection module 110." '217 patent, 14:3-18. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent

	out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
46. The system defined in claim 42, wherein the gateway translates the RF signal and the RF control signal into TC/IP for communication over the WAN.	The above contentions for claim 42 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38.

	"The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

	 FIG. 49 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway."

	Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also

	illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

47. The system defined in claim 42, wherein the WAN is the Internet.	The above contentions for claim 42 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

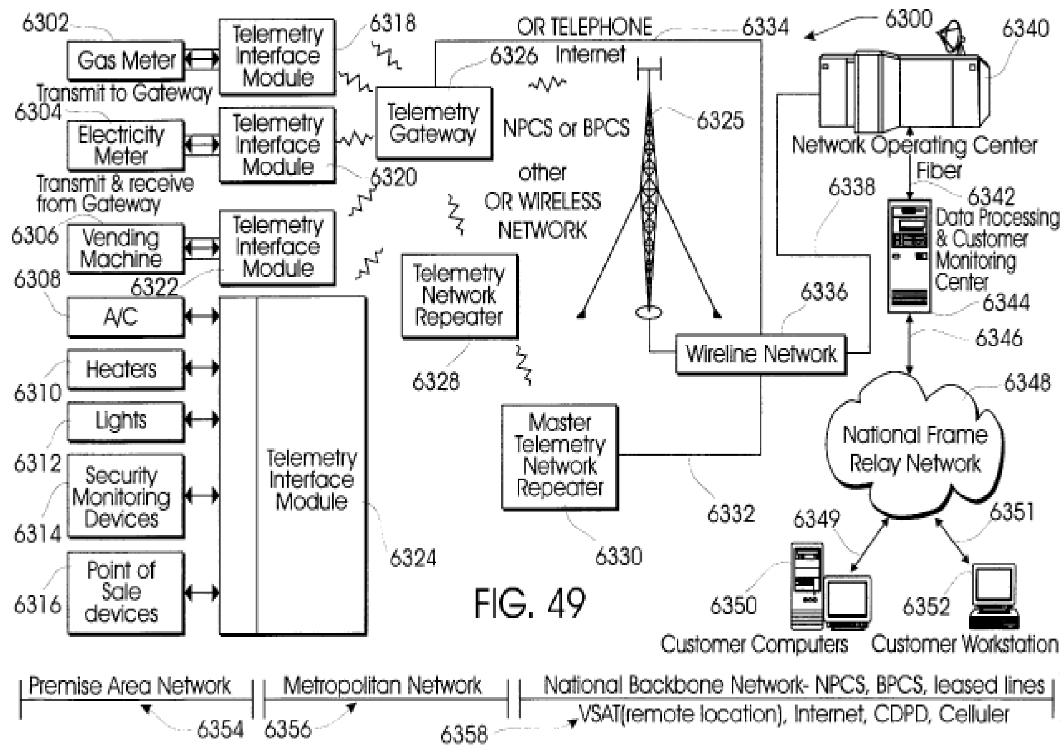
	out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.  FIG. 49 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example:

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The

	purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it

	may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
48. The system defined in claim 42, wherein the WAN is a dedicated Intranet.	The above contentions for claim 42 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

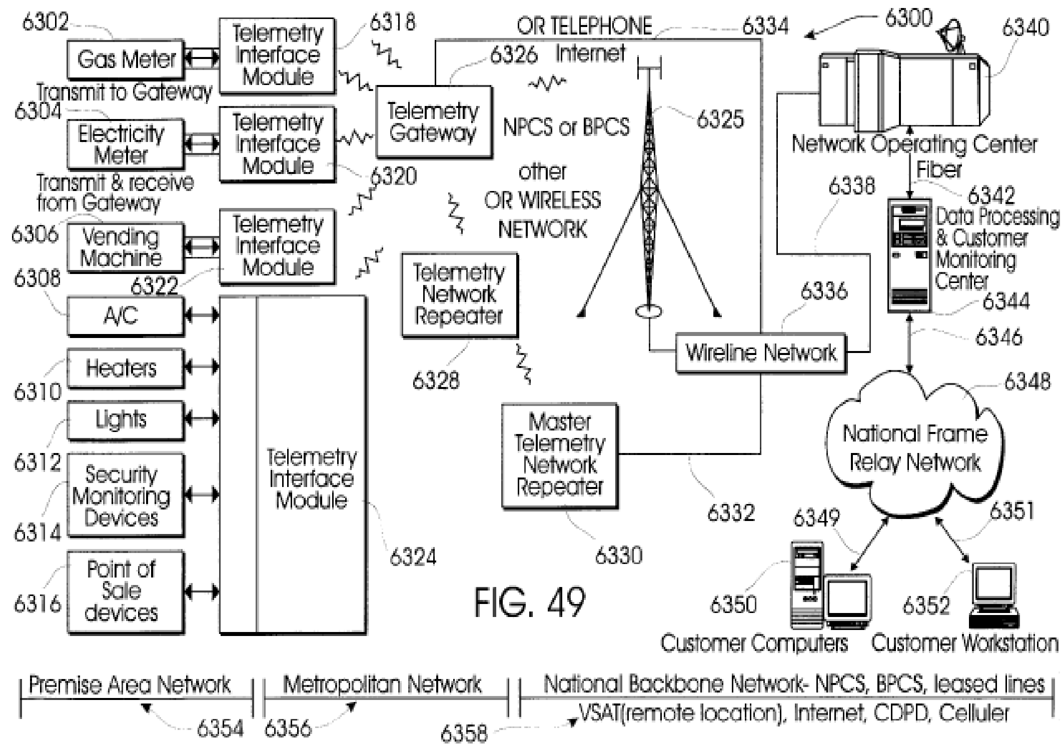
	module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.  FIG. 49

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

49. A system for managing an arrangement of application specific remote devices comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1.
a computer configured to execute a multiplicity of computer programs, each computer program executed to generate at least one control signal in response to at least one application system input, said computer integrated with a wide area network (WAN);	"The data collection module will gather the information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217 patent, 4:62-66. "2. The Data Collection Module a.. Overview The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for a RF signal modulated with a particular format. Once a valid signal is identified, the receiver stops hopping and decodes the entire data packet which is passes along CPU module

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

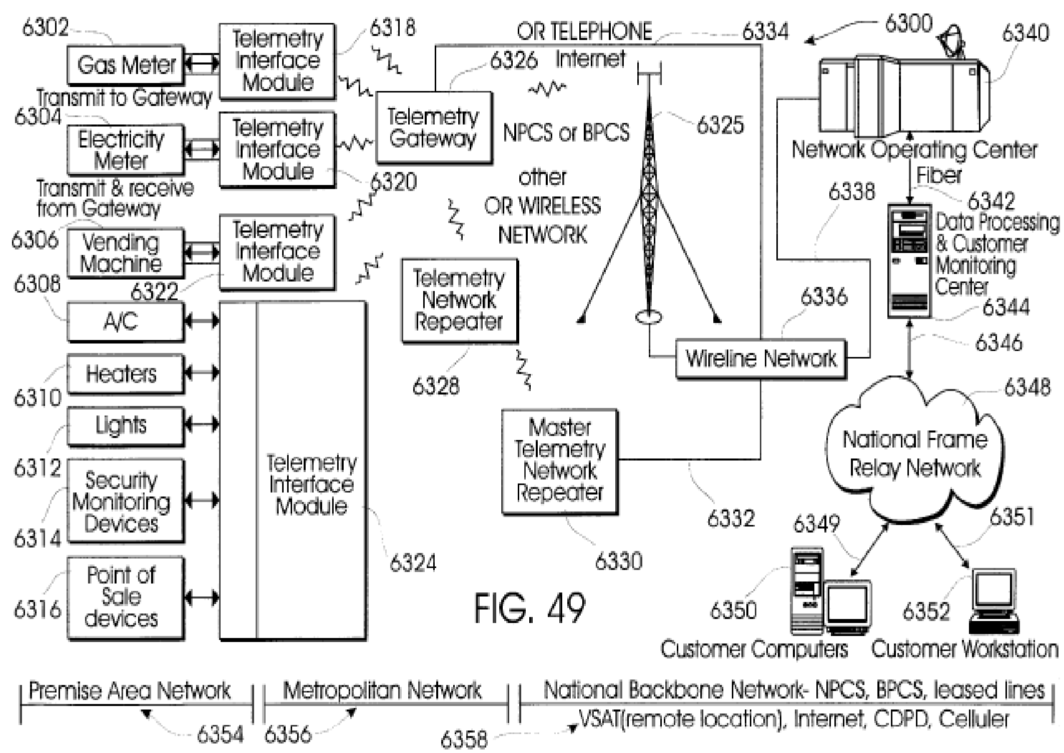
	for collection and evaluation." '217 patent, 18:45-55. "The data collection module 110 is a local, intelligent, data concentrator residing at or near the location of the sensor interface modules 102. The data collection module 110 act as the focal point of all the information that is collected from the sensor interface modules 102 within a monitored area such as a customer's premises and transmits this information to the host module 122 over standard communication systems 118." '217 patent, 19:17-23. "Information from the sensor interface module 102 is decoded and process in the data collection module 110 and prepared for transmission to the host module 122. The processor dynamically builds a table that stores the information received from each interface module. Information is grouped by the unique identifier assigned to each individual sensor interface module." '217 patent, 31:11-17. "An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217, 4:54-66. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
at least one gateway connected to the WAN configured as a two-way communication device to receive and translate the at least one control signal and the at least one application system input; said gateway further configured to translate and transmit a radio-frequency (RF) signal containing the control signal and destination information, said gateway further configured to receive and translate the at least one application system input and source information;	"4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router

	table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	
at least one wireless relatively low-power RF transceiver per computer program configured to receive the RF signal from the gateway; said wireless transceiver configured to translate the RF signal to an analog output signal, the wireless transceiver electrically coupled with an actuator and a sensor;	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22.

	'217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the

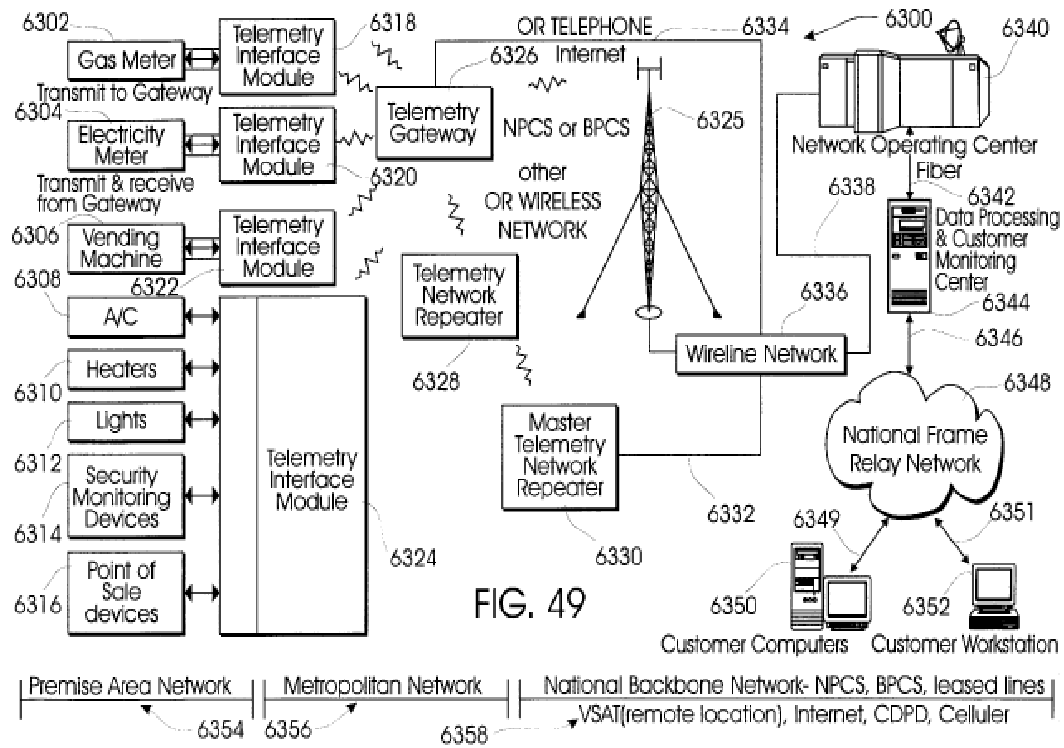
	sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
an actuator configured to receive the analog output signal from the wireless transceiver, the actuator further configured to translate the analog output signal into a response; and	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
a sensor configured to translate a physical condition into an analog version of the application system input.	"Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water

	systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19.
51. The system as defined in claim 49, wherein the at least one gateway translates the RF signal and the RF control signal into TCP/IP for communication over the WAN.	The above contentions for claim 49 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The

	sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

	 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway."

	Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

52. The system as defined in claim 49, wherein the WAN in the Internet.	The above contentions for claim 49 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

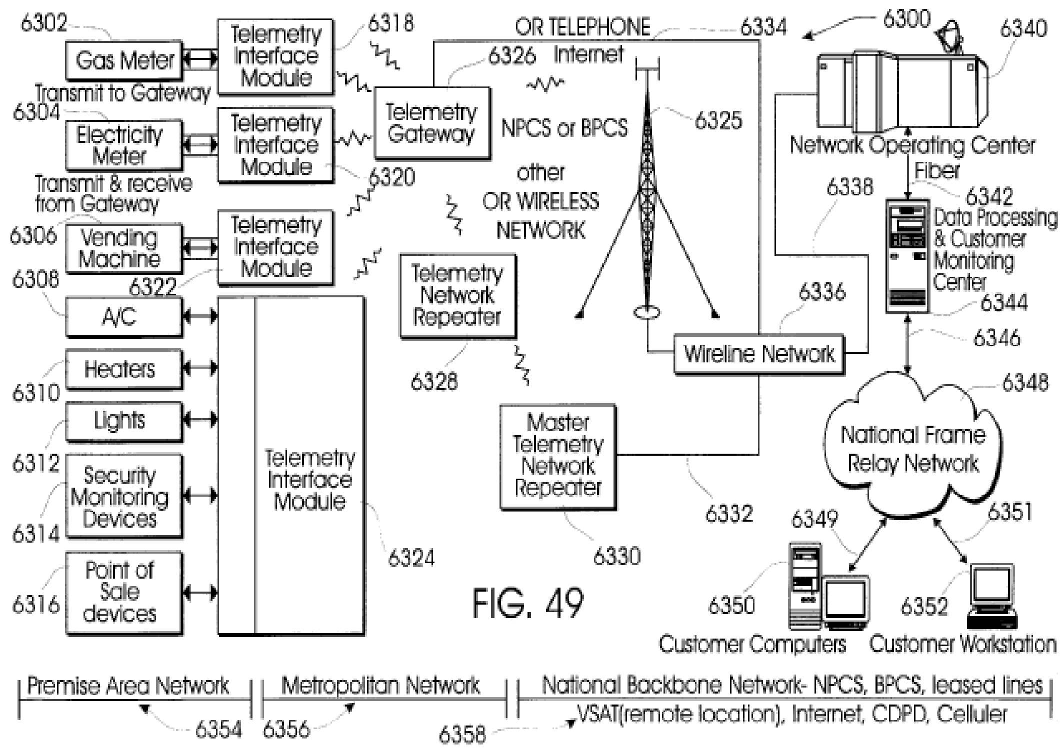
	out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.  To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example:

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The

	purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it

	may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
53. The system as defined in claim 49, wherein the WAN is a dedicated Intranet.	The above contentions for claim 49 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

<table>
<tr><td></td><td>module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

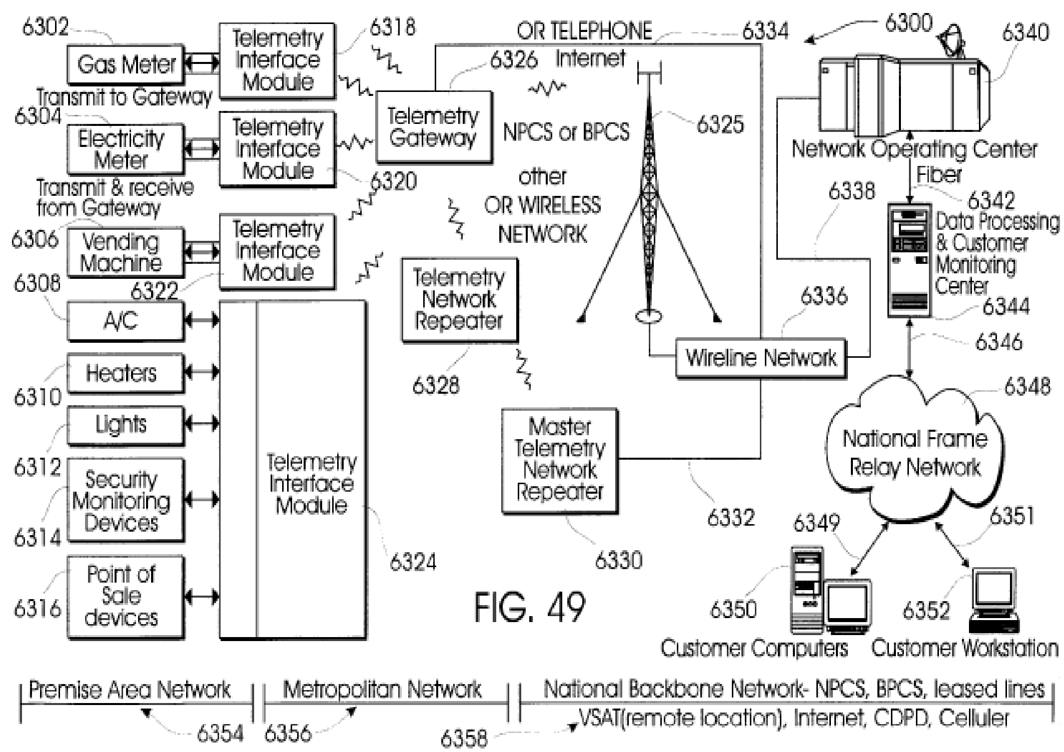
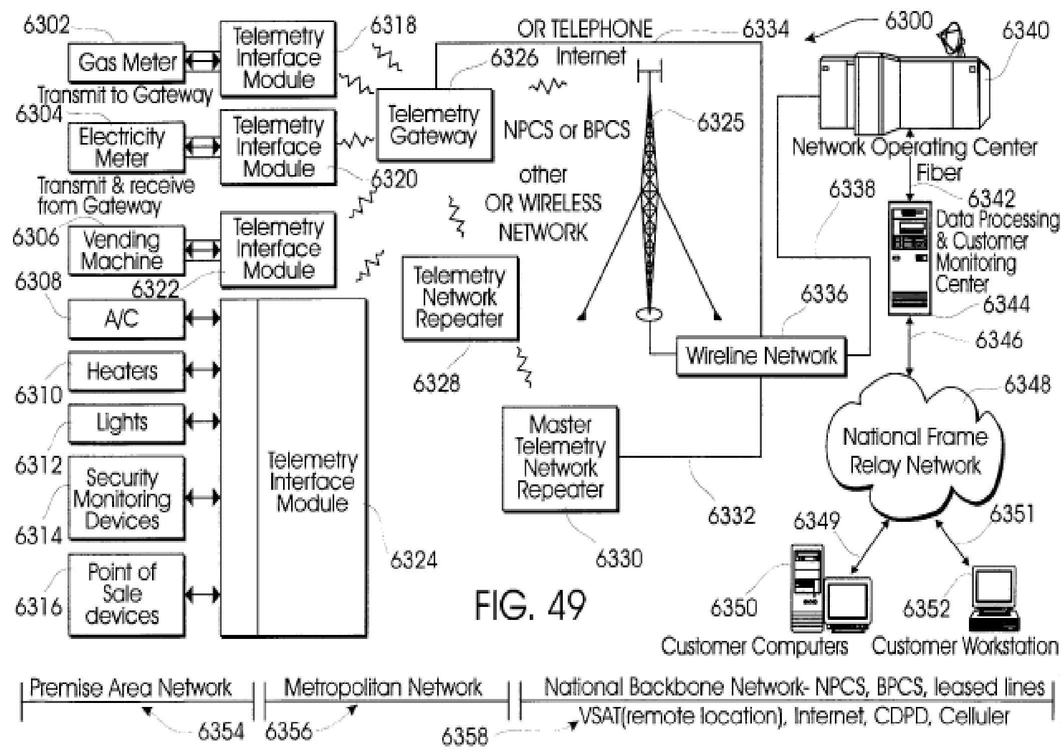


FIG. 49</td></tr>
<tr><td></td><td></td></tr>
<tr><td>54. The system as defined in claim 49,</td><td>The above contentions for claim 49 are hereby incorporated by reference.</td></tr>
</table>

wherein the at least one gateway is connected to the WAN by a network selected from the group consisting of a telecommunications network, private radio-frequency network, and a computer network.	"4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	module." '217 patent, 46:11-16.  FIG. 49
55. A method of collecting information and providing data services comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.

	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1.
adaptively configuring a data translator at the output of a local controller, wherein the data translator converts the output data stream into an information signal consisting of a transmitter code and an information field;	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43.

	"d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread

	spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

adaptively configuring at least one transmitter with the data translator, wherein the transmitter converts the information signal into a low-power RF signal;	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41.

	'217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
placing a plurality of relatively low-power radio-frequency (RF) transceivers dispersed geographically wherein the low power RF signal is received and repeated as required to communicate the information signal to a gateway, the gateway providing access to a WAN;	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1.

	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	'217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data.

	FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
translating the low-power RF signal within the gateway to a WAN compatible data transfer protocol;	"Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband

	PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
transferring the translated low-power RF signal via the WAN to a computer wherein the computer is configured to manipulate and store data provided in said signal; and	"4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command

	packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
granting client access to the computer.	"4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

56. The method of claim 55 wherein the WAN is the Internet.	The above contentions for claim 55 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

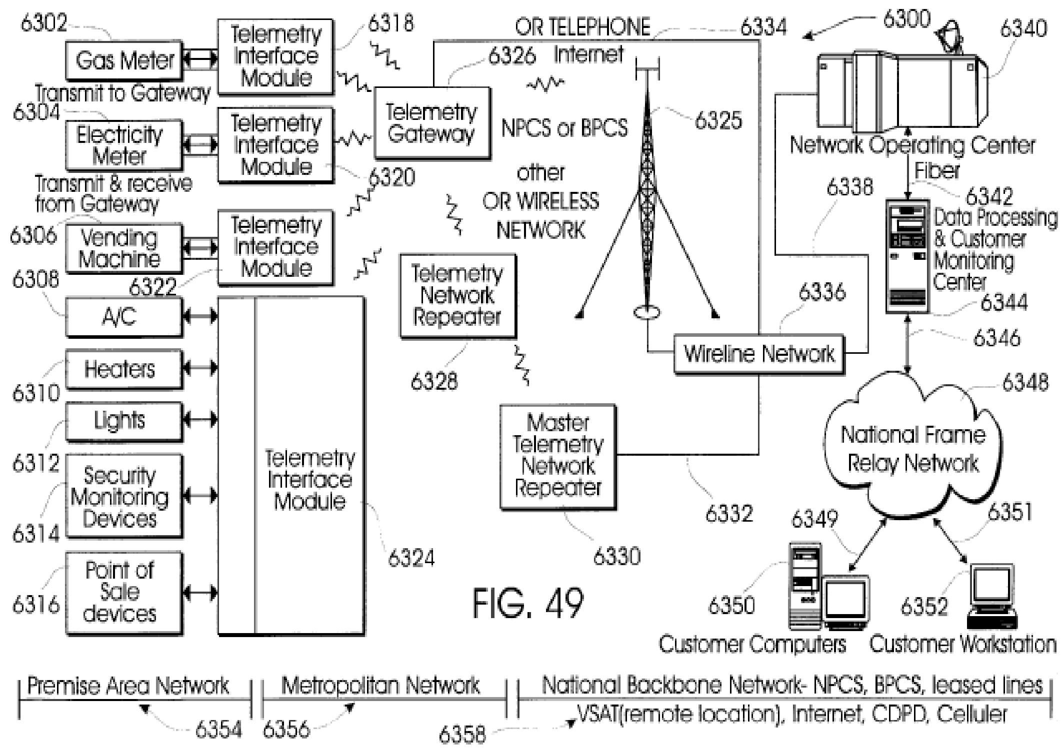


FIG. 49

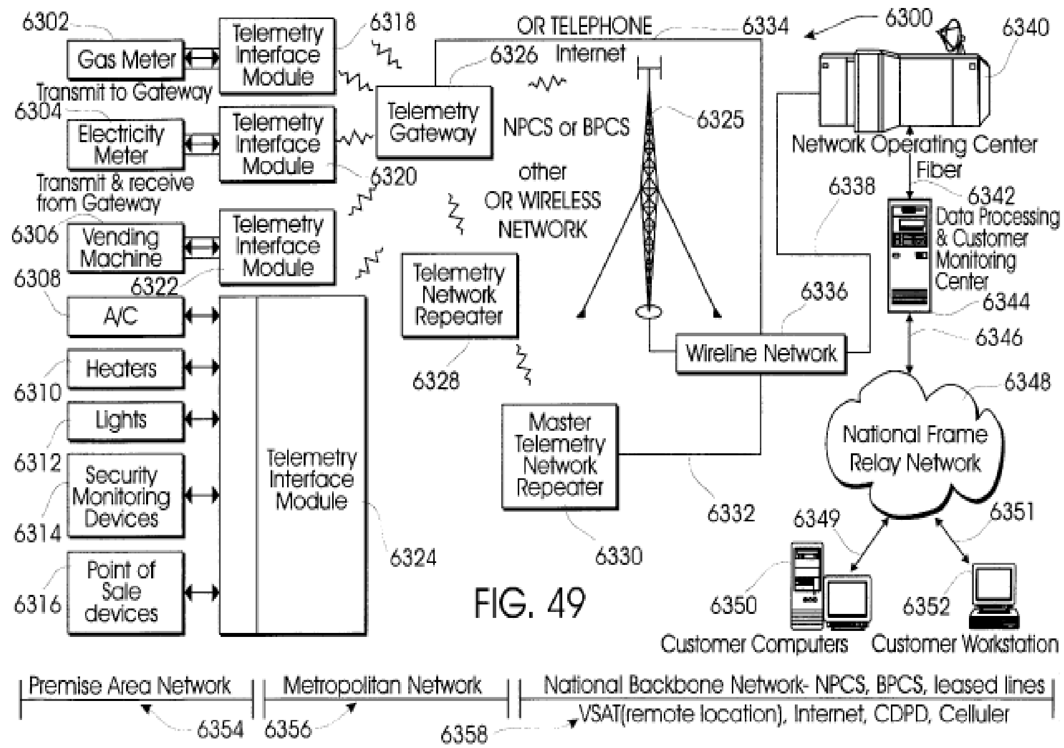
To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example:

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

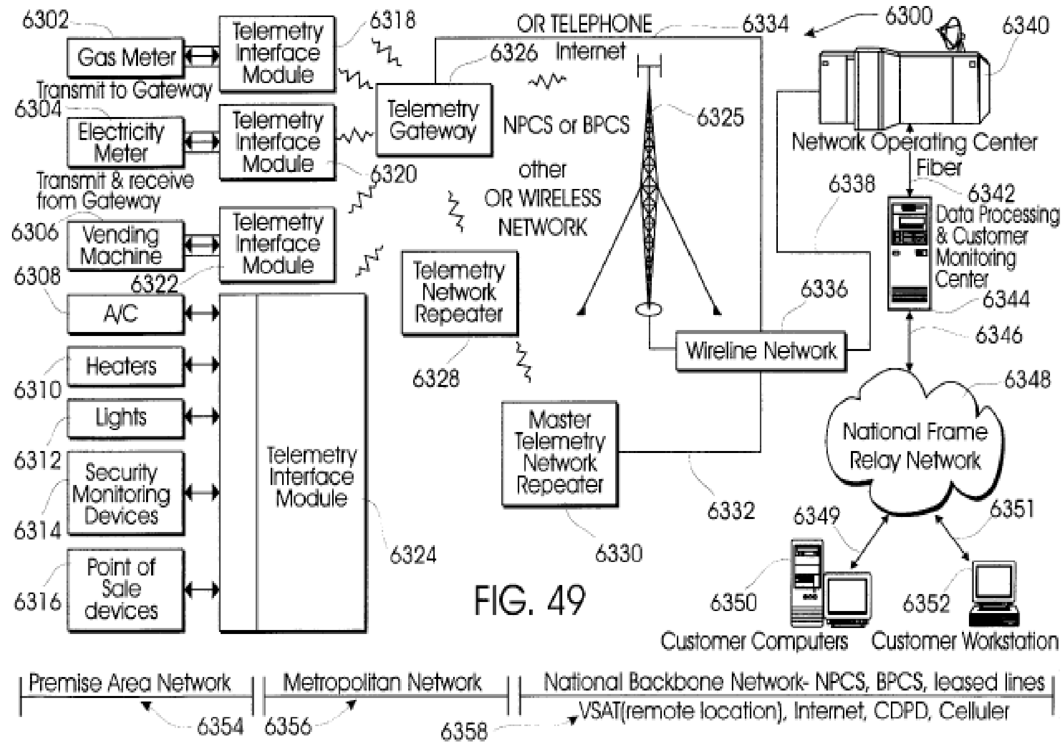
	purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it

	may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
57. The method of claim 55 wherein the WAN is an Intranet.	The above contentions for claim 55 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host

	module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.  FIG. 49
59. The method of claim 55 wherein the	The above contentions for claim 55 are hereby incorporated by reference.

clients access the information using a web browser.	"4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	 FIG. 49 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses:

	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However,

	some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for

	communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
60. A method for controlling an existing control system with a local controller comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1.
adaptively configuring a data translator disposed between and in communication with both a local controller and a wireless transceiver, wherein the data translator is configured to translate the local controller data stream into an information signal consisting of a transceiver identification code and a concatenation of function codes, the data translator further configured to translate control signals from the wireless transceiver	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1.

into local controller recognized control signals;	"Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way

	transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
remotely collecting data from the at least one relatively low-powered radio-frequency (RF) transceiver integrated with the data translator;	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110

	through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5.

	"Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
processing the data into an RF signal;	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102

	communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	signals." '217 patent, 33:28-41. '217 patent, Figure 44.
transmitting the RF signal to a gateway;	"Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. '217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module

	to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
translating the data in the RF signal into a network transfer protocol;	"An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217, 4:54-66. "2. The Data Collection Module a.. Overview The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for a RF signal modulated with a particular format. Once a valid signal is identified, the receiver stops hopping and decodes the entire data packet which is passes along CPU module

	for collection and evaluation." '217 patent, 18:45-55. "The data collection module 110 is a local, intelligent, data concentrator residing at or near the location of the sensor interface modules 102. The data collection module 110 act as the focal point of all the information that is collected from the sensor interface modules 102 within a monitored area such as a customer's premises and transmits this information to the host module 122 over standard communication systems 118." '217 patent, 19:17-23. "Information from the sensor interface module 102 is decoded and process in the data collection module 110 and prepared for transmission to the host module 122. The processor dynamically builds a table that stores the information received from each interface module. Information is grouped by the unique identifier assigned to each individual sensor interface module." '217 patent, 31:11-17. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
sending the translated data to a computer, wherein the computer is configured to appropriately respond to the data generated by at least one sensor by generating an appropriate;	"An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the

	host module over the commercially available information transmission systems." '217, 4:54-66. "2. The Data Collection Module a.. Overview The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for a RF signal modulated with a particular format. Once a valid signal is identified, the receiver stops hopping and decodes the entire data packet which is passes along CPU module for collection and evaluation." '217 patent, 18:45-55. "The data collection module 110 is a local, intelligent, data concentrator residing at or near the location of the sensor interface modules 102. The data collection module 110 act as the focal point of all the information that is collected from the sensor interface modules 102 within a monitored area such as a customer's premises and transmits this information to the host module 122 over standard communication systems 118." '217 patent, 19:17-23. "Information from the sensor interface module 102 is decoded and process in the data collection module 110 and prepared for transmission to the host module 122. The processor dynamically builds a table that stores the information received from each interface module. Information is grouped by the unique identifier assigned to each individual sensor interface module." '217 patent, 31:11-17. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent

	out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. "Returning to a consideration of FIG. 1, host module 122 is in communication with the data collection modules 110 through a network system. The host module 122 is a centrally or regionally located control center or centers which is used to monitor and control all the information exchange required by the monitoring system." '217 patent, 43:53-59.
sending the control signal via the network to the gateway;	"An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217, 4:54-66. "2. The Data Collection Module a.. Overview The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for a RF signal modulated with a particular format. Once a valid signal is identified, the receiver stops hopping and decodes the entire data packet which is passes along CPU module for collection and evaluation." '217 patent, 18:45-55. "The data collection module 110 is a local, intelligent, data concentrator residing at

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	or near the location of the sensor interface modules 102. The data collection module 110 act as the focal point of all the information that is collected from the sensor interface modules 102 within a monitored area such as a customer's premises and transmits this information to the host module 122 over standard communication systems 118." '217 patent, 19:17-23. "Information from the sensor interface module 102 is decoded and process in the data collection module 110 and prepared for transmission to the host module 122. The processor dynamically builds a table that stores the information received from each interface module. Information is grouped by the unique identifier assigned to each individual sensor interface module." '217 patent, 31:11-17. "Returning to a consideration of FIG. 1, host module 122 is in communication with the data collection modules 110 through a network system. The host module 122 is a centrally or regionally located control center or centers which is used to monitor and control all the information exchange required by the monitoring system." '217 patent, 43:53-59. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
translating the control signal from a network transfer protocol into an RF control signal;	"The data collection module 2300 includes a housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:3-7.

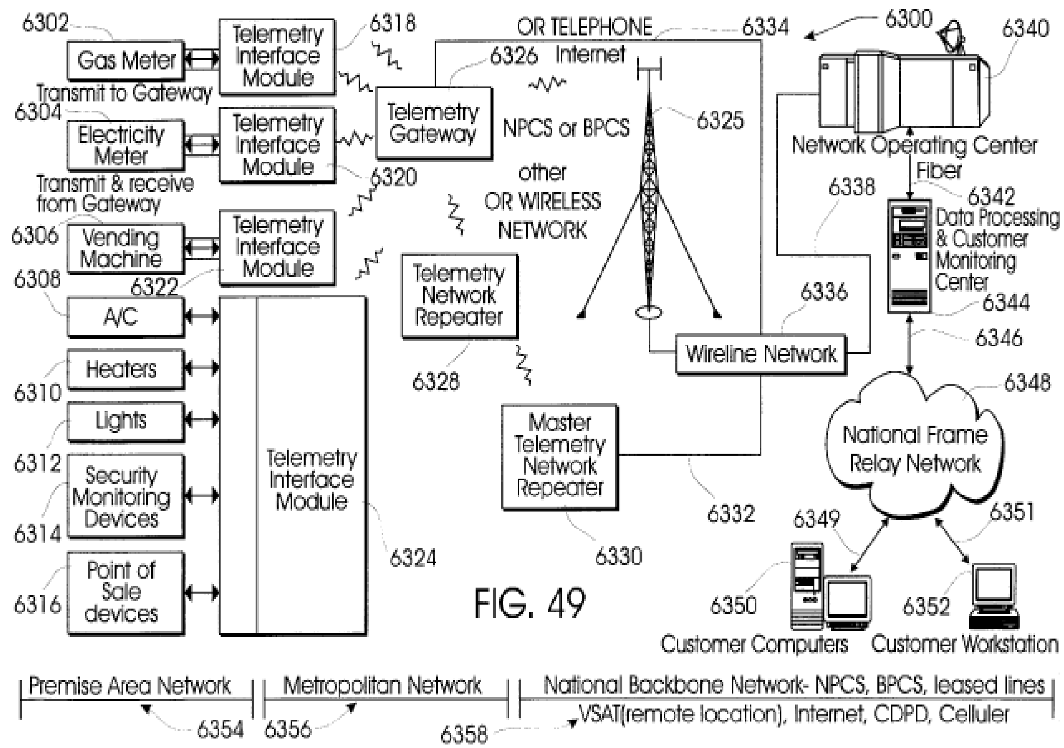
	"The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time." '217 patent, 32:31-37.
transmitting the RF control signal;	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
receiving the RF control signal;	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
translating the received RF control signal into a local controller recognized control signal;	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various

and	devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
applying the local controller recognized control signal via a local control to effect the desired system response.	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
61. The method of claim 60, wherein the step of transmitting the RF control signal is further performed by at least one transceiver, wherein the transceiver is configured to receive and transmit the RF control signal.	The above contentions for claim 60 are hereby incorporated by reference. "The data collection module 2300 includes a housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:3-7.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

62. The method of claim 60, wherein the network is the Internet.	The above contentions for claim 60 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

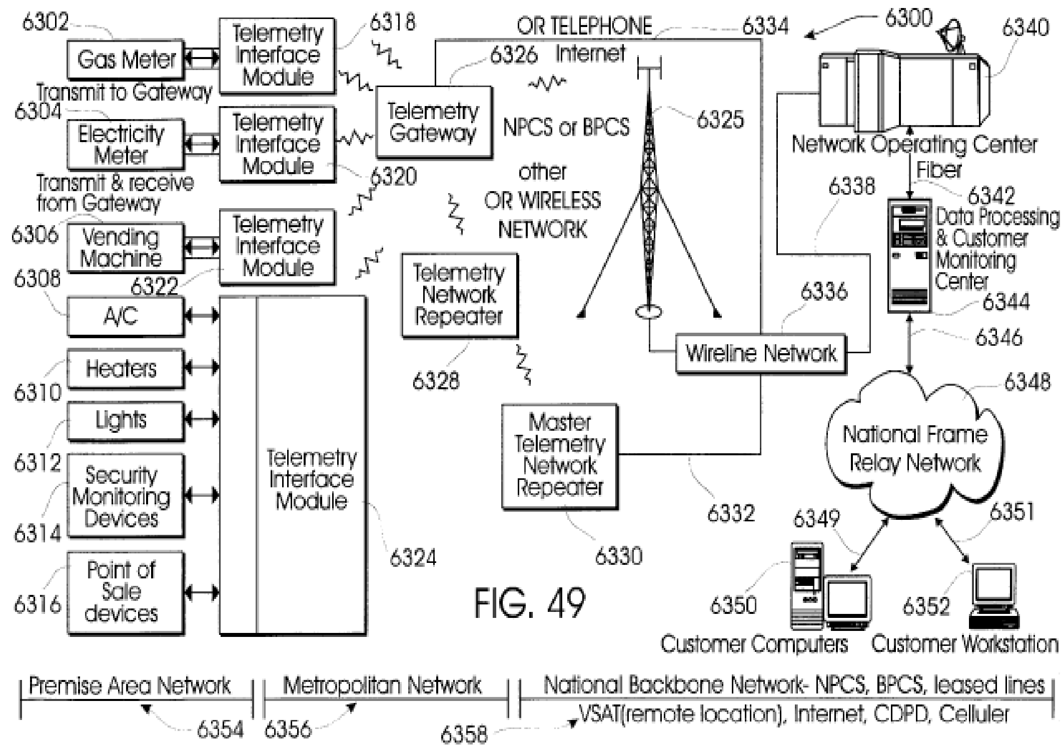
	out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.  FIG. 49 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example:

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

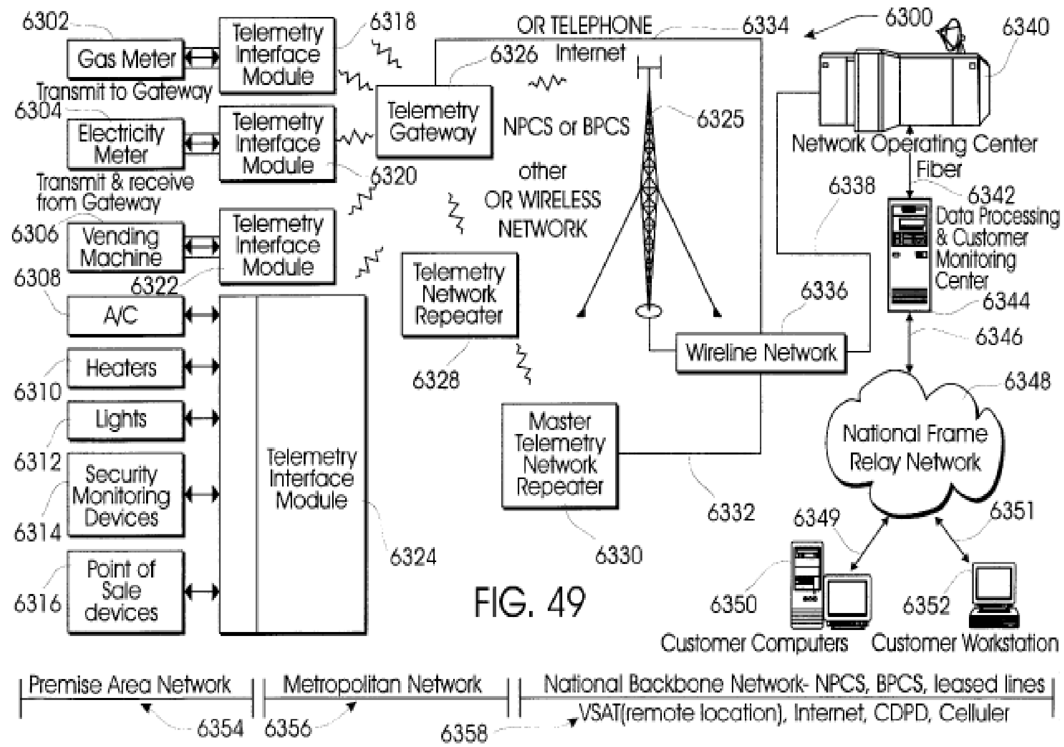
	purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it

	may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
63. The method of claim 60, wherein the network is an Intranet.	The above contentions for claim 60 are hereby incorporated by reference. "4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host

	module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.  FIG. 49
64. The method of claim 60, wherein the	The above contentions for claim 60 are hereby incorporated by reference.

network transfer protocol is TCP/IP.	"4. Transmitting Information to Host Module "Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	 FIG. 49 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses:

	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the

	data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only

Exhibit P4– Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 6,366,217

	one of which is shown in FIG. 1." '817 patent, 6:1-8.

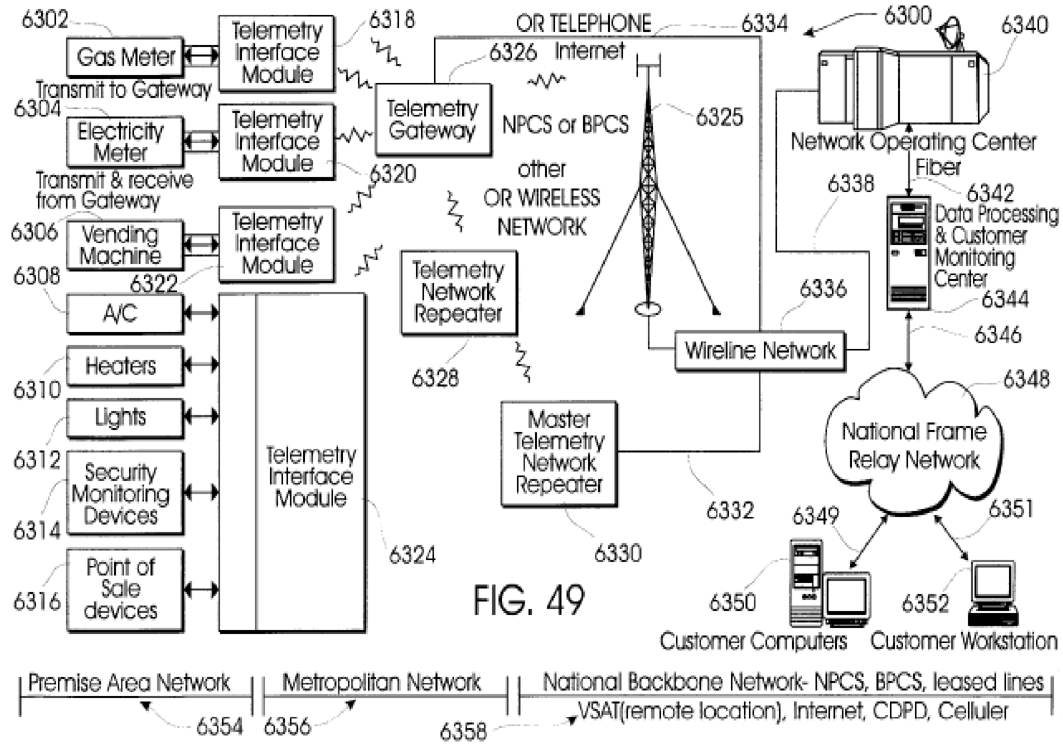
Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

The '732 Patent – Claim	U.S. Patent No. 6,366,217
1. A system for remote data collection, assembly, storage, event detection and reporting and control, comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"An effective monitoring system can be developed through the use of a sensor interface module, a data collection module, commercially available information transmission systems, and a host module. The sensor interface module will constantly monitor individual customer demand and usage to gather information for the monitoring system. The sensor interface module will send this information to the data collection module over unlicensed radio frequency bands. The data collection modules will gather information from sensor interface modules or other inputs wired directly and transmit the information to the host module over the commercially available information transmission systems." '217, 4:54-66. "Referring to the drawings in detail, FIG. 1 is a schematic representation for a wide-area remote telemetry system 100, constructed in accordance with the present invention. A plurality of sensor interface modules 102, which are electromechanical interfaces, act as data gathering equipment. Sensor interface modules 102 communicate with data collection modules 110 through a hardware or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmissions may be utilized." '217, 6:12-22. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.
	The above contentions for claim 1 are hereby incorporated by reference. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	 To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23.

	Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location

	which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

a plurality of transceivers dispersed geographically at defined locations, each transceiver electrically inter- faced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission;	"Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user

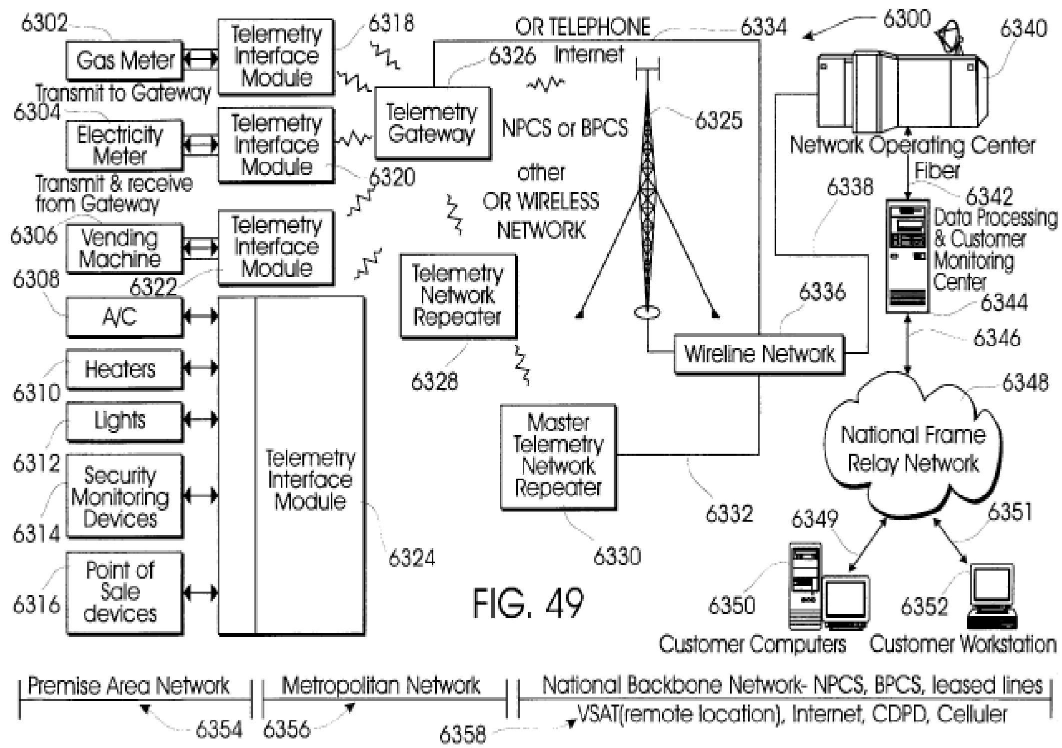
Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with	"4. Transmitting Information to Host Module Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

the nearby wireless transceiver, and transceiver identification information associated with one or more retransmit- ting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN and wherein at least one of said plurality of transceivers is also electrically interfaced with an actuator to control an actuated device.	information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217



To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
13. In a system comprising a plurality of wireless devices configured for remote wireless communication and comprising a device for monitoring and controlling remote devices, the device comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from another wireless transceiver in a predetermined signal type;	"Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body

	FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent, Figure 19. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7.

	"The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
a data controller operatively coupled to the transceiver and the sensor, the data controller configured to control the transceiver and receive data from the sensor,	"d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

the data controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.	which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41.
14. The device of claim 13, wherein the data controller is configured to receive data packets comprising control signals and in response to the control signals provide a control signal to an actuator for implementation of a command.	The above contentions for claim 13 are hereby incorporated by reference. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses:

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	"From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such

	special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
16. The device of claim 13**,** wherein the data controller is configured to receive data packets comprising a function code, and in response to the function code, implement a function.	The above contentions for claim 13 are hereby incorporated by reference. "PMM Commands. When a RDP packet is addressed to a PMM module (odd IP address), the data is interpreted as commands." '217 patent, 37:61-64. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
17. The device of claim 13**,** wherein the data controller is configured to format data packets for transmission via the transceiver, the data packets comprising a function code corresponding to sensed data and the unique identification code	The above contentions for claim 13 are hereby incorporated by reference. "PMM Commands. When a RDP packet is addressed to a PMM module (odd IP address), the data is interpreted as commands." '217 patent, 37:61-64. "5. Device Adjustment Modules

	Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page

	23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
18. The device of claim 13, further comprising a memory to store one or more function codes corresponding to the device, the function codes corresponding to a number of functions the data controller can implement.	The above contentions for claim 13 are hereby incorporated by reference. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41.
19. The device of claim 13, further comprising an actuator configured to receive command data from the controller and in response implement the command.	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel,

	U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition

	occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
31. A wireless communication system including wireless communication devices capable of wireless communication, the wireless communication system comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
at least one wireless communication device comprising a transceiver, the transceiver having a unique identification code and being interfaced with a sensor, the transceiver being configured to receive	"Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic

select information and identification information transmitted from another wireless transceiver in a predetermined signal type;	sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
a controller operatively coupled to the transceiver and the sensor, the controller configured to control transceiver operations and receive data from the sensor, the controller configured to format data packets for transmission via the transceiver with at least some data packets comprising data representative of data sensed with the sensor; and	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems to be monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort." '217 patent, 7:37-43. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41.

wherein the controller is configured to receive control signals from a data packet and based on the control signals send instructions to an actuator to implement a command.	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses:

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	"PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being

	shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination

	addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
32. The wireless communication system of claim 31**,** further comprising at least one gateway connected to a WAN configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to a computing device over the WAN.	The above contentions for claim 31 are hereby incorporated by reference. "4. Transmitting Information to Host Module Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected fro the sensor interface modules 012, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32: 23-41. "IP datagrams are completely encapsulated in the data fields of RDP packets. The sequence byte allows for up to 16 packets or fragments to be transported for a single IP datagram." '217 patent, 36:36-38. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out

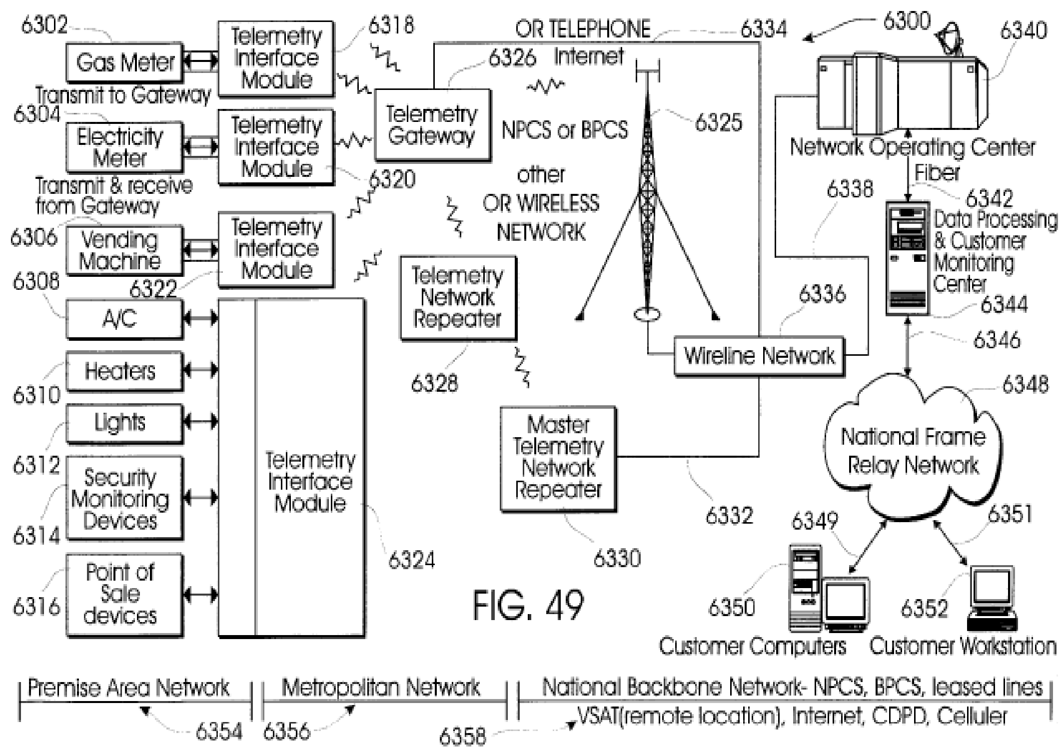
	on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.  FIG. 49
	The above contentions for claim 1 are hereby incorporated by reference.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	"The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

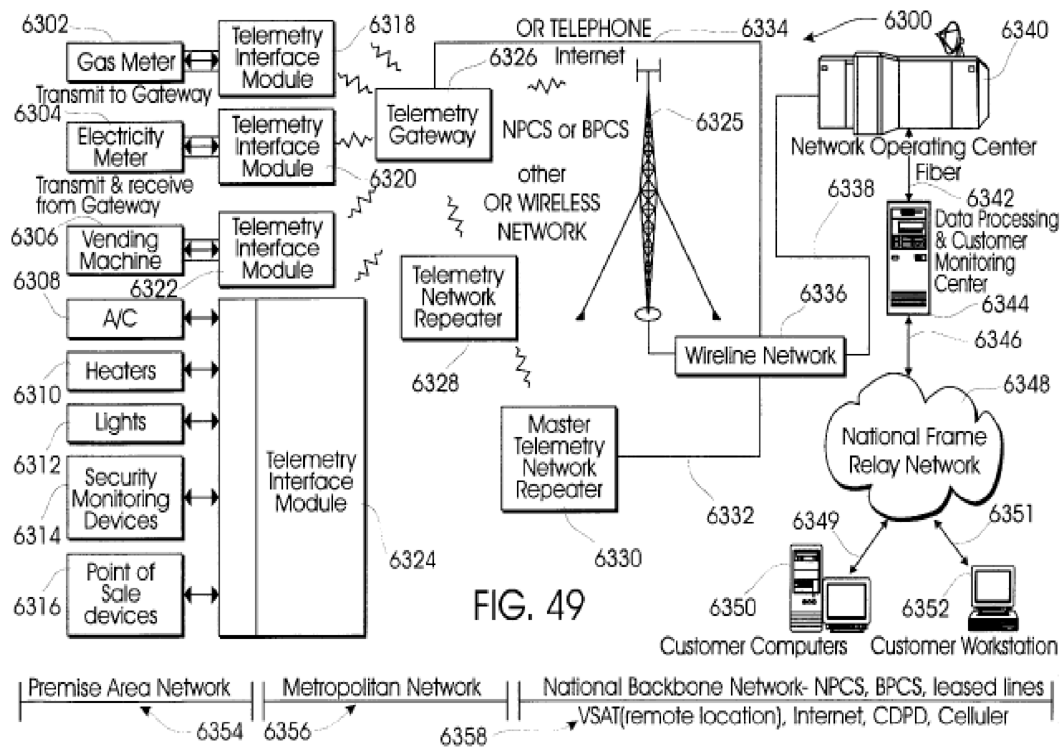


FIG. 49

To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the ‘217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the ‘217 patent with the teachings of one or more of the additional references teaching this limitation, for example:

Jubin discloses:

“The PRNET can also be accessed from other networks via an Internet gateway.” Jubin page 23.

	Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location

	which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

33. The wireless communication system of claim 31, further comprising a computing device configured to receive user input and based on user input, the computing device formatting control signals, and wherein the controller is configured to receive the control signals via wireless transmission and take action based on the control signals.	The above contentions for claim 31 are hereby incorporated by reference. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the

	commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate

	wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 6,366,217

	invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
34. The wireless communication system of claim 31, wherein the controller is configured to provide one or more function codes in the data packet in response to data sensed by the sensor.	The above contentions for claim 31 are hereby incorporated by reference. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical

	data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60.

	"During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19.

	U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
35. The wireless communication system of claim 31, wherein the controller comprises a memory containing a plurality of function codes specific to the sensor.	The above contentions for claim 31 are hereby incorporated by reference. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 6,366,217

The '780 Patent – Claim	U.S. Patent No. 6,366,217
1. In a system comprising a plurality of wireless devices, a device comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from a second wireless transceiver in a predetermined signal type;	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface

	module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The sensor interface module is programed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 6,366,217

	"FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the second wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. '217 patent, Figure 30.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 6,366,217

	"The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41. '217 patent, Figure 44.
a controller operatively coupled to the transceiver and the sensor, the controller configured to control the transceiver and receive data from the sensor, the controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "d. Sensor Interface Main Body

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 6,366,217

	FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent, Figure 19.
2. The device of claim 1, wherein the controller is configured to receive data packets comprising control signals and in response to the control signals provide a control signal to an actuator for implementation of a command.	The above contentions for claim 1 are hereby incorporated by reference. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 6,366,217

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23.

	Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through

	appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19.

	U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
4. The device of claim 1, wherein the controller is configured to receive data packets comprising a function code, and in response to the function code, implement a function.	The above contentions for claim 1 are hereby incorporated by reference. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 6,366,217

	patent, 47:1-14.
5. The device of claim 1, wherein the controller is configured to format data packets for transmission via the transceiver, the data packets comprising a function code corresponding to sensed data and the unique identification code that identifies the transceiver.	The above contentions for claim 1 are hereby incorporated by reference. "The sensor interface module is programed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
6. The device of claim 1, further comprising a memory to store one or more function codes corresponding to the device, the function codes corresponding to a number of functions the controller can implement.	The above contentions for claim 1 are hereby incorporated by reference. "The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 6,366,217

	interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41.
7. The device of claim 1, further comprising an actuator configured to receive command data from the controller and in response implement a command.	The above contentions for claim 1 are hereby incorporated by reference. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control

	module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses:

	"PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would

	have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses:

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 6,366,217

	"The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 6,366,217

	week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses:

	"Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer

	operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the

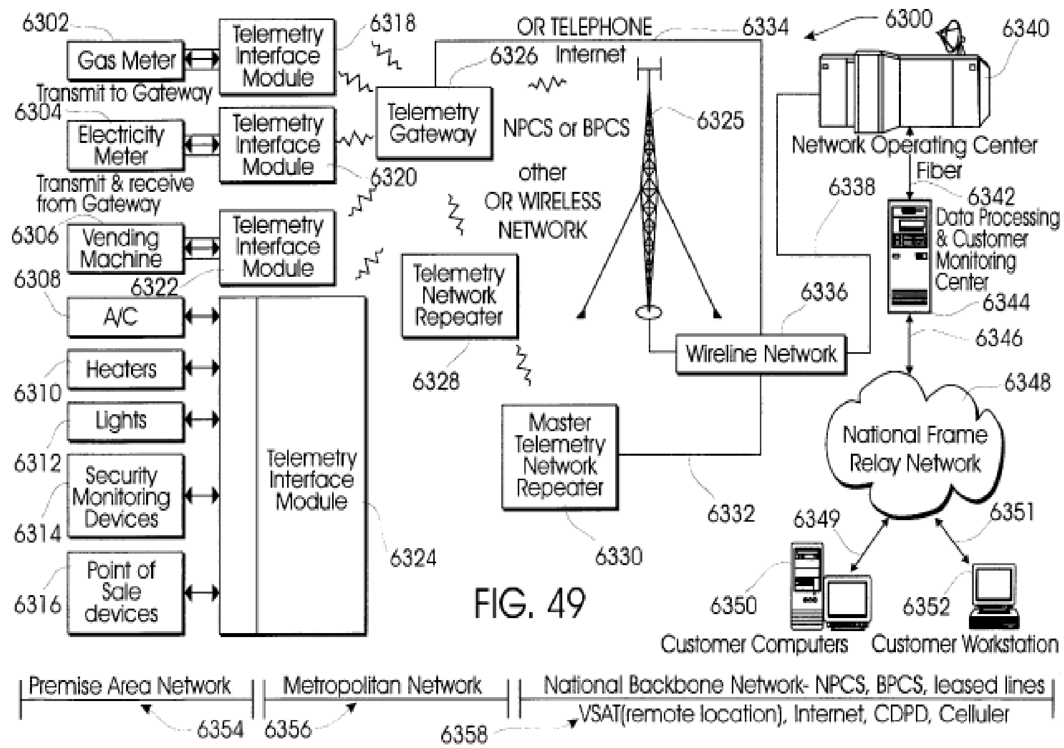
	system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
8. The device of claim 1, wherein the second transceiver is nearby to the transceiver.	The above contentions for claim 1 are hereby incorporated by reference. '217 patent, Figure 1. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108. Standard wire connection may be utilized for the hardware or wireless transmission 108, or various types of known, low-power, radio-frequency transmission may be utilized." '217 patent, 6:17-22.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8.908,842 based on U.S. Patent No. 6,366,217

The '842 Patent – Claim	U.S. Patent No. 6,366,217
1. A device for communicating information, the device comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a low-power transceiver configured to wirelessly transmit a signal comprising instruction data for delivery to a network of addressable devices;	"The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for an RF signal modulated with a particular format. Once the valid signal is identified, the receiver stops hopping and decodes the entire data packet which it passes along to CPU module for collection and evaluation. The receiver and the CPU modules are connected by a motherboard that also holds power regulation circuitry. … In one

	preferred embodiment, the communication module uses a MOTOROLA™ 68CH11 central processing unit, 32K of ram, 64K to 1 meg of eprom, and 144K of flash. The flow computer module uses a Rosemont™ 2055 with HART protocol signal." '217 patent, 18:45-19:1. "FIG. 25 is a block diagram of a data collection module 110. The data collection module 110 includes a radio frequency receiver 2002 to receive signals from the sensor interface module 102, a central processing unit information processor 2004 with associated firmware, a motherboard/power supply with battery backup 2006, and a transmitter/receiver 2008." '217 patent, 19:23-29. '217 patent, Figure 25.
an interface circuit for communicating with a central location; and	"The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for an RF signal modulated with a particular format. Once the valid signal is identified, the receiver stops hopping and decodes the entire data packet which it passes along to CPU module for collection and evaluation. The receiver and the CPU modules are connected by a motherboard that also holds power regulation circuitry. … In one preferred embodiment, the communication module uses a MOTOROLA™ 68CH11 central processing unit, 32K of ram, 64K to 1 meg of eprom, and 144K of flash. The flow computer module uses a Rosemont™ 2055 with HART protocol signal." '217 patent, 18:45-19:1. "Returning to a consideration of FIG. 1, the data collection module 110 provides the information transmission connection between the sensor interface module 102, and the network connection 116 to the host module 122. The data collection module 110 acts as the focal point of all the information which is collected from the sensor interface modules 102 within a monitored area such as a customer's premise and

	transmits this information to the host module 122 over standard communication systems 118." '217 patent, 19:13-23. "FIG. 25 is a block diagram of a data collection module 110. The data collection module 110 includes a radio frequency receiver 2002 to receive signals from the sensor interface module 102, a central processing unit information processor 2004 with associated firmware, a motherboard/power supply with battery backup 2006, and a transmitter/receiver 2008." '217 patent, 19:23-29. '217 patent, Figure 25. "4. Transmitting Information to Host Module Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected for the sensor interface modules 102, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32:23-41. "The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

	 FIG. 49
a controller coupled to the interface circuit and to the low-power transceiver, the controller configured to establish a communication link between at least one device in the network of addressable devices and the central location	"The sensor interface module is programmed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35. "The data collection module boxes are weatherproof enclosures that house data

using an address included in the signal, the communication link comprising one or more devices in the network of addressable, the controller further configured to receive one or more signals via the low-power transceiver and communicate information contained within the signals to the central location.	collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for an RF signal modulated with a particular format. Once the valid signal is identified, the receiver stops hopping and decodes the entire data packet which it passes along to CPU module for collection and evaluation. The receiver and the CPU modules are connected by a motherboard that also holds power regulation circuitry. … In one preferred embodiment, the communication module uses a MOTOROLA™ 68CH11 central processing unit, 32K of ram, 64K to 1 meg of eprom, and 144K of flash. The flow computer module uses a Rosemont™ 2055 with HART protocol signal." '217 patent, 18:45-19:1. "FIG. 25 is a block diagram of a data collection module 110. The data collection module 110 includes a radio frequency receiver 2002 to receive signals from the sensor interface module 102, a central processing unit information processor 2004 with associated firmware, a motherboard/power supply with battery backup 2006, and a transmitter/receiver 2008." '217 patent, 19:23-29. '217 patent, Figure 25.
7. The device of claim 1, wherein the controller is further configured to communicate a transceiver identification code to the central location via the interface circuit.	The contentions for claim 1 are hereby incorporated by reference. "FIG. 21 shows the general layout of the transmitted information signal The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60. '217 patent, Figure 21. "The identifier information is designed to identify the specific sensor interface module's transmission that is being received, and to identify any other type of

	information specific to the device being monitored. The information signal contains the data collected by the sensor interface module." '217 patent, 13: 62-67.
9. The device of claim 1, wherein transmitted and received signals further comprise a field configured to indicate a destination device for a subsequent transmission path to follow.	The contentions for claim 1 are hereby incorporated by reference. "The routing tables are held in the router non-volatile RAM and are used to move RDP packets from router A to router B using other router/radios if necessary. Router table entries can come from any of three sources, namely 1) a router IP command packet, 2) an external hookup with a laptop, or 3) recording the path of the received RDP packet." '217 patent, 36:60-65.
16. A device for communicating information, the device comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a processor; and	"The sensor interface module is programmed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35. "The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for an RF signal modulated with a particular format. Once the valid signal is identified, the receiver stops hopping and decodes the entire data packet which it passes along to CPU module for collection and evaluation. The receiver and the CPU modules are connected by a motherboard that also holds power regulation circuitry. … In one

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8.908,842 based on U.S. Patent No. 6,366,217

	preferred embodiment, the communication module uses a MOTOROLA™ 68CH11 central processing unit, 32K of ram, 64K to 1 meg of eprom, and 144K of flash. The flow computer module uses a Rosemont™ 2055 with HART protocol signal." '217 patent, 18:45-19:1. "FIG. 25 is a block diagram of a data collection module 110. The data collection module 110 includes a radio frequency receiver 2002 to receive signals from the sensor interface module 102, a central processing unit information processor 2004 with associated firmware, a motherboard/power supply with battery backup 2006, and a transmitter/receiver 2008." '217 patent, 19:23-29. '217 patent, Figure 25.
a memory, the memory comprising logical instructions that when executed by the processor are configured to cause the device to:	"The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for an RF signal modulated with a particular format. Once the valid signal is identified, the receiver stops hopping and decodes the entire data packet which it passes along to CPU module for collection and evaluation. The receiver and the CPU modules are connected by a motherboard that also holds power regulation circuitry. … In one preferred embodiment, the communication module uses a MOTOROLA™ 68CH11 central processing unit, 32K of ram, 64K to 1 meg of eprom, and 144K of flash. The flow computer module uses a Rosemont™ 2055 with HART protocol signal." '217 patent, 18:45-19:1.
wirelessly transmit a signal comprising instruction data for delivery to a network of addressable low-power transceivers;	"FIG. 25 is a block diagram of a data collection module 110. The data collection module 110 includes a radio frequency receiver 2002 to receive signals from the sensor interface module 102, a central processing unit information processor 2004 with associated firmware, a motherboard/power supply with battery backup 2006, and a transmitter/receiver 2008." '217 patent, 19:23-29. '217 patent, Figure 25.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8.908,842 based on U.S. Patent No. 6,366,217

	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
establish a communication link between at least one low-power transceiver in the network of addressable low-power transceivers and a central location based on an address included in the signal, the communication link comprising one or more low-power transceivers in the network of addressable low-power transceivers; and	"The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for an RF signal modulated with a particular format. Once the valid signal is identified, the receiver stops hopping and decodes the entire data packet which it passes along to CPU module for collection and evaluation. The receiver and the CPU modules are connected by a motherboard that also holds power regulation circuitry. … In one preferred embodiment, the communication module uses a MOTOROLA™ 68CH11 central processing unit, 32K of ram, 64K to 1 meg of eprom, and 144K of flash. The flow computer module uses a Rosemont™ 2055 with HART protocol signal." '217 patent, 18:45-19:1. "FIG. 25 is a block diagram of a data collection module 110. The data collection module 110 includes a radio frequency receiver 2002 to receive signals from the sensor interface module 102, a central processing unit information processor 2004 with associated firmware, a motherboard/power supply with battery backup 2006, and a transmitter/receiver 2008." '217 patent, 19:23-29.

	'217 patent, Figure 25.
receive one or more low-power RF signals and communicate information contained within the signals to the central location along with a unique transceiver identification number over the communication link.	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract. "The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for an RF signal modulated with a particular format. Once the valid signal is identified, the receiver stops hopping and decodes the entire data packet which it passes along to CPU module for collection and evaluation. The receiver and the CPU modules are connected by a motherboard that also holds power regulation circuitry. … In one preferred embodiment, the communication module uses a MOTOROLA™ 68CH11 central processing unit, 32K of ram, 64K to 1 meg of eprom, and 144K of flash. The flow computer module uses a Rosemont™ 2055 with HART protocol signal." '217 patent, 18:45-19:1. "FIG. 25 is a block diagram of a data collection module 110. The data collection module 110 includes a radio frequency receiver 2002 to receive signals from the sensor interface module 102, a central processing unit information processor 2004 with associated firmware, a motherboard/power supply with battery backup 2006, and a transmitter/receiver 2008." '217 patent, 19:23-29. "FIG. 21 shows the general layout of the transmitted information signal The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.

	'217 patent, Figure 21. "The identifier information is designed to identify the specific sensor interface module's transmission that is being received, and to identify any other type of information specific to the device being monitored. The information signal contains the data collected by the sensor interface module." '217 patent, 13: 62-67.
17. A device for communicating information, the device comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a low-power transceiver that is configured to wirelessly receive a signal including an instruction data from a remote device;	"The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "The data collection module boxes are weatherproof enclosures that house data

	collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for an RF signal modulated with a particular format. Once the valid signal is identified, the receiver stops hopping and decodes the entire data packet which it passes along to CPU module for collection and evaluation. The receiver and the CPU modules are connected by a motherboard that also holds power regulation circuitry. … In one preferred embodiment, the communication module uses a MOTOROLA™ 68CH11 central processing unit, 32K of ram, 64K to 1 meg of eprom, and 144K of flash. The flow computer module uses a Rosemont™ 2055 with HART protocol signal." '217 patent, 18:45-19:1. "FIG. 25 is a block diagram of a data collection module 110. The data collection module 110 includes a radio frequency receiver 2002 to receive signals from the sensor interface module 102, a central processing unit information processor 2004 with associated firmware, a motherboard/power supply with battery backup 2006, and a transmitter/receiver 2008." '217 patent, 19:23-29. '217 patent, Figure 25.
an interface circuit for communicating with a central location;	"The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for an RF signal modulated with a particular format. Once the valid signal is identified, the receiver stops hopping and decodes the entire data packet which it passes along to CPU module for collection and evaluation. The receiver and the CPU modules are connected by a motherboard that also holds power regulation circuitry. … In one preferred embodiment, the communication module uses a MOTOROLA™ 68CH11 central processing unit, 32K of ram, 64K to 1 meg of eprom, and 144K of flash. The flow computer module uses a Rosemont™ 2055 with HART protocol signal." '217 patent, 18:45-19:1.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8.908,842 based on U.S. Patent No. 6,366,217

	"Returning to a consideration of FIG. 1, the data collection module 110 provides the information transmission connection between the sensor interface module 102, and the network connection 116 to the host module 122. The data collection module 110 acts as the focal point of all the information which is collected from the sensor interface modules 102 within a monitored area such as a customer's premise and transmits this information to the host module 122 over standard communication systems 118." '217 patent, 19:13-23. "FIG. 25 is a block diagram of a data collection module 110. The data collection module 110 includes a radio frequency receiver 2002 to receive signals from the sensor interface module 102, a central processing unit information processor 2004 with associated firmware, a motherboard/power supply with battery backup 2006, and a transmitter/receiver 2008." '217 patent, 19:23-29. '217 patent, Figure 25. "4. Transmitting Information to Host Module Data is transmitted to the host module through the transmitter/receiver or other modem device of the data collection module 110. The data collection module 110 concentrates the data collected for the sensor interface modules 102, and uploads the information to the host module on a periodic time basis, at a preset time, or in response from a demand from the host module. … The communications between the host module and the data collection module is designed to be two-way and interactive. This allows for the data retrieval to be near real-time. …The transmission from the data collection module 110 to the host module may be by means of any number of various systems including Narrow band PCS, Broadband PCS, WPCS, CDPD, cable modems, a phone line with Internet packet data, or other information transmission systems." '217 patent, 32:23-41. "The data collection module will send and receiving information to and from the host

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8.908,842 based on U.S. Patent No. 6,366,217

<table>
<tr>
<td></td>
<td>
module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module. The data collection module will send and receiving information to and from the host module as an Internet protocol (TCP/IP) signal. The information signal will be sent out on the Internet, transferred across the Internet, and received by the other module." '217 patent, 46:11-16.

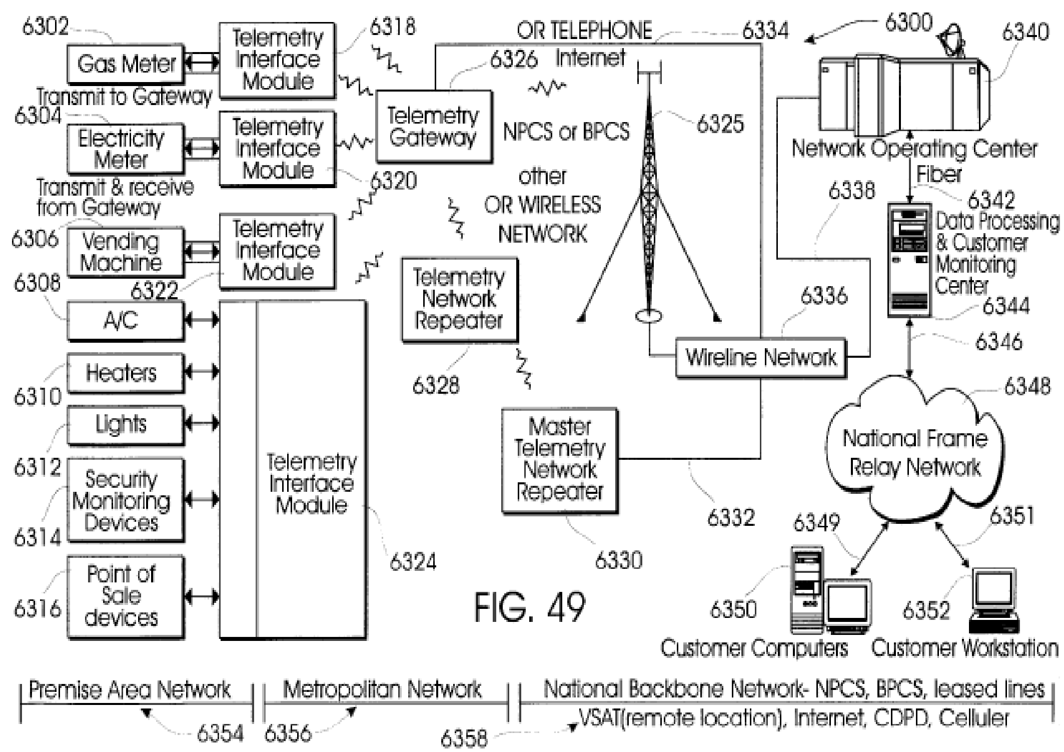


FIG. 49
</td>
</tr>
</table>

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8.908,842 based on U.S. Patent No. 6,366,217

a controller coupled to the interface circuit and to the low-power transceiver, the controller being configured to establish a communication link between the remote device and the central location using address-indicative data included in the signal;	"The sensor interface module is programmed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35. "The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for an RF signal modulated with a particular format. Once the valid signal is identified, the receiver stops hopping and decodes the entire data packet which it passes along to CPU module for collection and evaluation. The receiver and the CPU modules are connected by a motherboard that also holds power regulation circuitry. … In one preferred embodiment, the communication module uses a MOTOROLA™ 68CH11 central processing unit, 32K of ram, 64K to 1 meg of eprom, and 144K of flash. The flow computer module uses a Rosemont™ 2055 with HART protocol signal." '217 patent, 18:45-19:1. "FIG. 25 is a block diagram of a data collection module 110. The data collection module 110 includes a radio frequency receiver 2002 to receive signals from the sensor interface module 102, a central processing unit information processor 2004 with associated firmware, a motherboard/power supply with battery backup 2006, and a transmitter/receiver 2008." '217 patent, 19:23-29. '217 patent, Figure 25.
the controller further configured to receive one or more data signals from the central location via the interface circuit and communicate information contained within the signals to the remote device.	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 8.908,842 based on U.S. Patent No. 6,366,217

	"The data collection module boxes are weatherproof enclosures that house data collection electronics. RF input signals in the range of 902 Mhz to 928 Mhz are received through the horizontally polarized antenna and routed to the receiver module. The receiver module hops the 25 pre-set frequencies looking for an RF signal modulated with a particular format. Once the valid signal is identified, the receiver stops hopping and decodes the entire data packet which it passes along to CPU module for collection and evaluation. The receiver and the CPU modules are connected by a motherboard that also holds power regulation circuitry. … In one preferred embodiment, the communication module uses a MOTOROLA™ 68CH11 central processing unit, 32K of ram, 64K to 1 meg of eprom, and 144K of flash. The flow computer module uses a Rosemont™ 2055 with HART protocol signal." '217 patent, 18:45-19:1. "FIG. 25 is a block diagram of a data collection module 110. The data collection module 110 includes a radio frequency receiver 2002 to receive signals from the sensor interface module 102, a central processing unit information processor 2004 with associated firmware, a motherboard/power supply with battery backup 2006, and a transmitter/receiver 2008." '217 patent, 19:23-29. "FIG. 21 shows the general layout of the transmitted information signal The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60. '217 patent, Figure 21. "The identifier information is designed to identify the specific sensor interface module's transmission that is being received, and to identify any other type of information specific to the device being monitored. The information signal contains the data collected by the sensor interface module." '217 patent, 13: 62-67.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

The '893 Patent – Claim	U.S. Patent No. 6,366,217
1. A system for communicating commands and sensed data between remote devices, the system comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a plurality of transceivers, each transceiver being in communication with at least one other of the plurality of transceivers, wherein each transceiver has a unique address, wherein the unique address identities an individual transceiver, wherein each transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with the other transceivers via preformatted messages;	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing

	unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The sensor interface module is programed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9.

	"FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.
a controller, connected to one of the plurality of transceivers, the controller being in communications with each of the plurality of transceivers via a controller transceiver, the controller communicating via preformatted messages;	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware;

	battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent, Figure 19.
wherein the preformatted messages comprises at least one packet, wherein the packet comprises:	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.
a receiver address comprising a scalable address of the at least one of the intended receiving transceivers;	"After a data packet has been collected, the data will be transmitted to a data collection module or other device using Frequency Shift Keying (FSK) modulation." '217 16:6-8. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below.

	For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson:

	"FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in

	several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual

	address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	commercialized and proposing extensions for IP addressing.
sender address comprising the unique address of the sending transceiver;	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.
a command indicator comprising a command code;	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

	Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special

	requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
at least one data value comprising a scalable message; and	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60. "In the preferred embodiment, the header information is

	approximately 65 bytes of information and the data bytes are approximately 8 bytes of information." '217 patent, 15:13-15. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number,

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically

	transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and

	an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector comprising a redundancy check error detector; and	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.
wherein the controller sends preformatted command messages via the controller transceiver, and the plurality of transceivers send preformatted response messages.	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29.
2. The system of claim 1, wherein the plurality of transceivers further comprise at least one integrated transceiver, wherein the integrated transceiver comprises:	The above contentions for claim 1 are hereby incorporated by reference.
one of the plurality of transceivers; and	"As shown in FIG. 2 the sensor interface module 102 can be made with a sensor interface main body 200, sensor connecting harness 202 and n external hardware sensor 204. The main body 200 can be installed internally to the monitored device or can be

	made to fit in a small enclosure or casing 210 for external mounting on or in close proximity to the monitored device." '217 patent, 7:50-58. '217 patent, Figure 2.
a sensor detecting a condition and outputting a sensed data signal to the transceiver.	"As shown in FIG. 2 the sensor interface module 102 can be made with a sensor interface main body 200, sensor connecting harness 202 and n external hardware sensor 204. The main body 200 can be installed internally to the monitored device or can be made to fit in a small enclosure or casing 210 for external mounting on or in close proximity to the monitored device." '217 patent, 7:50-58. '217 patent, Figure 2.
3. The system of claim 2, wherein the at least one integrated transceiver receives the preformatted command message requesting sensed data, confirms the receiver address as its own unique address, receives the sensed data signal, formats the sensed data signal into scalable byte segments, determines a number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet, wherein the packets are equal to the number of segments.	The above contentions for claim 2 are hereby incorporated by reference. "Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29. "In the preferred embodiment, the header information is approximately 65 bytes of information and the data bytes are approximately 8 bytes of information." '217 patent, 15:13-15. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would

	have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252

	patent, 39:28-43. ‘252 patent, Figure 31. “For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module’s assigned tier address for that network service module to be addressed.” ‘252, 42:18-39. “FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and “network message” field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. …

	Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for

	extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
10. The system of claim 1, wherein the plurality of transceivers further comprise at least one actuated transceiver, wherein the actuated transceiver comprises:	The above contentions for claim 1 are hereby incorporated by reference. "5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
one of the plurality of transceivers;	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a

	Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
a sensor detecting a second condition and outputting a sensed data signal to the transceiver; and	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
an actuator controlling a third condition and receiving control signals from the transceiver.	"5. Device Adjustment Modules Device adjustment modules are used to monitor and control the operation of various devices and applications according to various

	utility prices and the device consumption information. An example of a device control module is a module to control a Johnson Control TM thermostat by attaching a device control module with a power system, processor with associated firmware, and a radio. The module monitors the energy usage by the air conditioning and heating systems controlled by the thermostat and can adjust the operation usage to stay below increased billing increment costs for energy supply and usage. A two-way sensor interface module would be utilized. The device adjustment module transmits information to the system and receives controlling information from system update transmissions." '217 patent, 47:1-14.
17. A system for communicating commands and sensed data between remote devices, the system comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.
a plurality of transceivers, each transceiver being in communication with at least one other of the plurality of transceivers, wherein each transceiver has a unique address, wherein the unique address identities an individual transceiver, wherein each transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with the other transceivers via preformatted messages;	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware;

	battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "Sensor interface modules 102 communicate with data collection modules 110 through a hardwire or wireless transmission 108." '217 patent, 6:16-19. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. "The sensor interface module is programed to set the unique identifier for the device and the frequency that it transmits to the data collection module." '217 patent, 13:33-35. "The data collection modules 110 collect information from a plurality of different sensor interface modules. One-way transmission from the sensor interface module 102 to the data collection module 110 is preferred because frequent updates to the data collection module provide an adequate time resolution for potential demand reads while allowing the overall system costs to be significantly less than a two-way communication system. In addition, significant power savings can be obtained in

	the sensor interface modules 102 by utilizing a one-way transmission system between the sensor interface module 102 and data collection module 110. This one-way transmission is acceptable because the sensor interface module 102 transmits at user configurable thresholds." '217 patent, 30:60-31:5. "Other applications may require two-way transmission, such as monitoring and control of lights, security monitoring devices, utility disconnect actions, utility outage reporting, or other control functions." '217 patent, 31:6-9. "FIG. 30 shows a simplified schematic layout of data repeater module which is generally designated by the numeral 2300. The data collection 2300 includes housing 2302 which minimally contains a central processing unit 2306 and a spread spectrum receiver/radio 2308. The spread spectrum receiver/radio 2308 is used to receive or transmit signals 2320 to sensor interface modules." '217 patent, 20:1-7. "The data repeater module can perform both the functions of a standard data collection module in gathering information from sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	which transmits and receives signals." '217 patent, 33:28-41.
a controller, connected to one of the plurality of transceivers, the controller being in communications with each of the plurality of transceivers via a controller transceiver, the controller communicating via preformatted messages, wherein the preformatted messages comprises at least one packet, wherein the packet comprises:	"The sensor interface modules 102 are intelligent communications devices which attach to gas, electric, and water meters and other types of monitored equipment. The basic sensor interface modules 102 may be adapted to any number of systems being monitored, including but not limited to: electrical systems, gas systems, water systems, security systems, temperature control systems, vending machines, and remotely monitored devices of any sort. The sensor interface modules 102 include an appropriate hardware sensor for the device being monitored; a computerized monitoring system with associated firmware; battery power supply and/or converter for external power; and a transmitter." '217 patent, 7:35-48. "d. Sensor Interface Main Body FIG. 19 shows a simple block diagram layout of a sensor interface modules designated by the numeral 102. The sensor interface module 102 contains a pulse encoder 1300, central processing unit micro-controller 1302, a spread spectrum transmitter 1304 which operate together to form a transmission signal 1306. … The sensor interface module is designed to communicate with the data collection module to transmit information to be forwarded to a host module. A common RF (radio frequency) module will be incorporated with a microprocessor into a circuit board." '217 patent, 12:27-41. '217 patent, Figure 19.
a receiver address comprising a scalable address of the at least one of the intended receiving transceivers;	"After a data packet has been collected, the data will be transmitted to a data collection module or other device using Frequency Shift Keying (FSK) modulation." '217 16:6-8.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin

	page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module,

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type.

	Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365,

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
sender address comprising the unique address of the sending transceiver;	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.
a command indicator comprising a command code;	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET,

	discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel

	page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51.

	U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

at least one data value comprising a scalable message; and	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60. "In the preferred embodiment, the header information is approximately 65 bytes of information and the data bytes are approximately 8 bytes of information." '217 patent, 15:13-15. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). …

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	Routing Header: The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are

	supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network

	service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector comprising a redundancy check error detector;	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.
wherein the controller sends preformatted command messages via the controller transceiver, and the plurality of transceivers send preformatted response messages; and	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29.
wherein at least one of the plurality of transceivers further sends preformatted emergency messages.	"The information signal contains the data collected by the sensor interface module or the emergency code." '217 patent, 13:66-14:1.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation. For example, U.S. Patent No. 5,907,491 discloses that "[w]hile it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28. U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
18. The system of claim 17, wherein the controller maintains periods of silence by not sending the preformatted command messages during predetermined time periods; and	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation. For example, U.S. Patent No. 5,907,491 discloses that "[w]hile it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28. U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
wherein the at least one of the plurality of transceivers detects a period of silence and sends the preformatted emergency message during the period of silence.	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	For example, U.S. Patent No. 5,907,491 discloses that "[w]hile it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28. U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
37. A method of communicating between geographically remote devices, the method comprising:	"A wide-area remote telemetry system which monitors and controls remote device by means of a information control system. The system uses a plurality of sensor interface modules which constantly monitor devices for triggering events. The sensor interface modules transmit information to at least one data collection module which gathers, process, stores and transmits information to a host system via standard external communication systems." '217 patent, Abstract.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

sending a message;	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29.
receiving the message at one or more of the remote devices;	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29.
processing the message;	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29.
preparing a response message;	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29.
receiving the response message;	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor,

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29.
processing the response message	
wherein all messages comprise at least one packet, the packet having a predetermined format;	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.
wherein the predetermined format comprises:	
a receiver address comprising a scalable address of the at least one of the intended receiving remote devices;	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.
a sender address comprising an unique address of the sender;	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.
a command indicator comprising a command code;	"Johnson '252 either uses an IDT or CDT which performs the functions of an IDT. The IDT includes a transmitter, processor, memory, and receiver. The IDT transmits a polling signal to the RCNs, receives the RCN information, transmits an acknowledgement of the receipt of the RCN information, and stores the RCN information in memory." '217 patent, 4:23-29. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 7,027,773 ("the '773

	patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247.

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 5,963,650 discloses:

Exhibit P4 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 6,366,217

	"Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed

	through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a scalable data value comprising a scalable message; and	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60. "In the preferred embodiment, the header information is approximately 65 bytes of information and the data bytes are approximately 8 bytes of information." '217 patent, 15:13-15. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '217 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '217 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers

	that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and

	receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network

	service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for

	Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector that is a redundancy check error detector; and	"FIG. 21 shows the general layout of the transmitted information signal. The signal consists of a header, information signal, and a CRC. The header information includes a preamble and a sensor interface module identifier." '217 patent, 13:56-60.
wherein the steps of sending and receiving are repeated until the message is received by the intended receiver.	"The data repeater module can perform both the functions of a standard data collection module in gathering information from

	sensor interface modules, and perform the repeater functions to get the information to a connected data collection module for transmission over any number of the commercial transmission systems for data. FIG. 44 shows a schematic diagram of the overall data repeater system, called a Wireless Radio Backbone (WRB). The WRB is a wireless radio Serial Line Internet Protocol (SLIP) transport which was designed for bi-directional communication between data collection module processors. Each data collection module has a processor which talks to a router which talks to a radio which transmits and receives signals." '217 patent, 33:28-41.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,907,491

The '492 Patent – Claim	U.S. Patent No. 5,907,491
1. In a communication system to communicate command and sensed data between remote devices, the system comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a receiver address comprising a scalable address of at least one remote device;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. '491 patent, 7:25-38. '491 patent, Figure 8. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the

	command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20. "During the setup/configuration process, the monitor 4 receives a unique monitor 4 ID number (address), a date/time synchronization by the command station 6 (current time/date), and a date/time of a monitor's first status poll. At the date/time of the first status poll, the monitor 4 will turn on its transceiver and wait to receive a status poll command." '491 patent, 12:31-36. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor 4 transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet." '491 patent, 16:50-54. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers*

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,907,491

	Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields

	demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service

	modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse

	poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a command indicator comprising command code;	"FIG. 8 illustrates a typical preferred time-division

	communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. '491 patent, 7:25-38. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity."

	"To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor 4 transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet." '491 patent, 16:50-54. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are

	available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses:

	"The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a data value comprising a scalable message; and	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18

	shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine

	and/or modify the '491patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable

	fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43.

	'252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is

	identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields.

	Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a controller associated with a remote device comprising a transceiver configured to send and receive wireless signals, the remote device configured to send a preformatted message comprising the receiver address, a command indicator, and the data value via the transceiver to at least one other remote device.	"The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. "The digital sensor signals are fed to a monitor computer 418, such as the Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes a data processor 420 which performs 16-bit operations with 32-bit extended registers. The monitor computer 418 also incorporates memory 422 consisting of at least 32 kilobytes of static RAM, a timer 424, a serial interface 426, and a battery status monitor circuit 428." '491 patent, 5:46-55. '491 patent, Figure 3.

	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. '491 patent, Figure 8.
2. The system of claim 1, further comprising:	The above contentions for claim 1 are hereby incorporated by reference.
a plurality of transceivers each having a unique address, the transceiver being one of the plurality of transceivers;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the

	status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an

	operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,907,491

	transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the

	serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23.
a plurality of controllers associated with each the controller associated with at least one of the transceivers, the controller being in communication with at least one other transceiver with a preformatted message, the preformatted message having at least one scalable field;	"The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the

	machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor

	transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR,

	encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules

	belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39.

	"FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source

	Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
at least one sensor associated with at least one of the transceivers to detect a condition and output a data signal to the transceiver; and	"The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration,

	electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which

	amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63.
at least one actuator associated with at least one of the transceivers to activate a device.	"In another preferred embodiment, each machine monitor in the wireless machine monitoring system includes at least one sensor which senses a parameter of the machine and produces digital data, a wireless transmitter and receiver, and a data processor for controlling the operation of the sensor, transmitter and receiver. The monitor data processor receives and processes the digital sensor data according to a first processing configuration for communicating the digital data to the transmitted and causing the transmitter to produce transmission signals corresponding to the digital data. The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal. The system also includes means for reprogramming the monitor data processor to change the programmed processing configuration, enabling reconfiguration of the machine monitor so that data is processed according to a second process configuration.

	A hand-held configuration device can be used for reprogramming the monitor data processor. Alternatively, reprogramming is accomplished by the command station. The configuration device includes a wireless transmitter and receiver, and a data processor for controlling and causing the transmitter to transmit configuration signals to the monitor for reprogramming of the monitor data processor and for processing wireless signals transmitted by the monitor. A user interface is also provided for inputting user commands to the configuration device data processor to control reprogramming of machine monitors." '491 patent, 3:5-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." ''491 patent, 7:56-60. "During the setup/configuration process, the monitor 4 receives a unique monitor 4 ID number (address), a date/time synchronization by the command station 6 (current time/date), and a date/time of a monitor's first status poll. At the date/time of the first status poll, the monitor 4 will turn on its transceiver and wait to receive a status poll command." '491 patent, 12:31-37. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be

	programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20.
3. The system of claim 1, wherein the controller sends the preformatted message via an associated transceiver, and at least one transceiver sends the preformatted response message.	The above contentions for claim 1 are hereby incorporated by reference. "In another preferred embodiment, each machine monitor in the wireless machine monitoring system includes at least one sensor which senses a parameter of the machine and produces digital data, a wireless transmitter and receiver, and a data processor for controlling the operation of the sensor, transmitter and receiver. The monitor data processor receives and processes the digital sensor data according to a first processing configuration for communicating the digital data to the transmitted and causing the transmitter to produce transmission signals corresponding to the digital data. The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal. The system also includes means for reprogramming the monitor data processor to change the programmed processing configuration, enabling reconfiguration of the machine monitor so that data is processed according to a second process configuration. A hand-held configuration device can be used for reprogramming the monitor data processor. Alternatively, reprogramming is

	accomplished by the command station. The configuration device includes a wireless transmitter and receiver, and a data processor for controlling and causing the transmitter to transmit configuration signals to the monitor for reprogramming of the monitor data processor and for processing wireless signals transmitted by the monitor. A user interface is also provided for inputting user commands to the configuration device data processor to control reprogramming of machine monitors." '491 patent, 3:5-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." ''491 patent, 7:56-60. "During the setup/configuration process, the monitor 4 receives a unique monitor 4 ID number (address), a date/time synchronization by the command station 6 (current time/date), and a date/time of a monitor's first status poll. At the date/time of the first status poll, the monitor 4 will turn on its transceiver and wait to receive a status poll command." '491 patent, 12:31-37. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through

	appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20.
4. The system of claim 1, wherein at least one transceiver receives the preformatted message requesting sensed data, confirms the receiver address as its own unique address, receives a sensed data signal, formats the sensed data signal into scalable byte segments, determines the number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet.	The above contentions for claim 1 are hereby incorporated by reference. "In another preferred embodiment, each machine monitor in the wireless machine monitoring system includes at least one sensor which senses a parameter of the machine and produces digital data, a wireless transmitter and receiver, and a data processor for controlling the operation of the sensor, transmitter and receiver. The monitor data processor receives and processes the digital sensor data according to a first processing configuration for communicating the digital data to the transmitted and causing the transmitter to produce transmission signals corresponding to the digital data. The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal. The system also includes means for reprogramming the monitor data processor to change the programmed processing configuration, enabling reconfiguration of the machine monitor so that data is processed according to a second process configuration. A hand-held configuration device can be used for reprogramming the monitor data processor. Alternatively, reprogramming is accomplished by the command station. The configuration device includes a wireless transmitter and receiver, and a data processor for controlling and causing the

	transmitter to transmit configuration signals to the monitor for reprogramming of the monitor data processor and for processing wireless signals transmitted by the monitor. A user interface is also provided for inputting user commands to the configuration device data processor to control reprogramming of machine monitors." '491 patent, 3:5-34. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header

	corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or

	destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information

	is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59.

	'252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
6. The system of claim 1, wherein each remote device is adapted to transmit and receive radio frequency transmissions to and from	The above contentions for claim 1 are hereby incorporated by reference.

at least one other transceiver.	"The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This

	signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23. '491 patent, Figure 7.
8. A method of communicating command and sensed data between remote wireless devices, the method comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
providing a receiver to receive at least one message;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station

	includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1.

	"In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which

	amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion

	when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23.
wherein the message has a packet comprising a command indicator comprising a command code, a scalable data value comprising a scalable message, and an error detector that is a redundancy check error detector; and	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35.

	"The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58.

	"The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "A preferred embodiment of the invention provides for error detection in the data that the command station receives from the machine monitor 4. In accordance with a preferred error detection scheme, the machine monitor 4 transmits a 16-bit cyclic redundancy check (CRC) message immediately after transmitting the sensor data message." '491 patent, 16:25-30. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No.

	6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header

	and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248.

	U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection

	bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class

	address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message

	format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space.

	Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
providing a controller to determine if at least one received message is a duplicate message and determining a location from which the duplicate message originated.	"To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "A preferred embodiment of the invention provides for error detection in the data that the command station receives from the machine monitor 4. In accordance with a preferred error detection scheme, the machine monitor 4 transmits a 16-bit cyclic redundancy check (CRC) message immediately after transmitting the sensor data message." '491 patent, 16:25-30.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,907,491

9. The method of claim 8, further comprising providing at least one remote wireless communication device, wherein at least one of the devices comprise geographically remote transceivers adapted to transmit and receive at least one message using radio frequency transmissions.	The above contentions for claim 8 are hereby incorporated by reference. "The basic components of the system may be configured in various ways, some of which are illustrated in FIG. 1, to meet the requirements of the particular location where the system is used. If a particular machine is located such that machine monitors 4 placed on the machine are beyond the receiving range of the command station 6, or are out of the line of sight to the command station 6, a properly located repeater 8 is used to receive the signals from the machine monitors and retransmit the signals to the command station 6." '491 patent 4:58-67.
10. The method of claim 8, further comprising providing at least one remote wireless communication device, wherein at least one of the devices has a unique address and the packet further comprises at least one scalable address field to contain the unique address for at least one device.	The above contentions for claim 8 are hereby incorporated by reference. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example,

	Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets:

	U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31.

	"For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present,

	resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375,

	October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
11. The method of claim 8, further comprising providing an actuator associated with at least one of the remote devices, the actuator configured to actuate in response to the command code.	The above contention for claim 8 is hereby incorporated by reference. "In another preferred embodiment, each machine monitor in the wireless machine monitoring system includes at least one sensor which senses a parameter of the machine and produces digital data, a wireless transmitter and receiver, and a data processor for controlling the operation of the sensor, transmitter and receiver. The monitor data processor receives and processes the digital sensor data according to a first processing configuration for communicating the digital data to the transmitted and causing the transmitter to produce transmission signals corresponding to the digital data. The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal. The system also includes means for reprogramming the monitor data processor to change the programmed processing configuration, enabling reconfiguration of the machine monitor so that data is processed according to a second process configuration. A hand-held configuration device can be used for reprogramming the monitor data processor. Alternatively, reprogramming is accomplished by the command station. The configuration device includes a wireless transmitter and receiver, and a data processor for controlling and causing the transmitter to transmit configuration signals to the monitor for

	reprogramming of the monitor data processor and for processing wireless signals transmitted by the monitor. A user interface is also provided for inputting user commands to the configuration device data processor to control reprogramming of machine monitors." '491 patent, 3:5-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." ''491 patent, 7:56-60. "During the setup/configuration process, the monitor 4 receives a unique monitor 4 ID number (address), a date/time synchronization by the command station 6 (current time/date), and a date/time of a monitor's first status poll. At the date/time of the first status poll, the monitor 4 will turn on its transceiver and wait to receive a status poll command." '491 patent, 12:31-37. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,907,491

13. The method of claim 8, further comprising determining if an error exists in a packet of the at least one message.	The above contention for claim 8 is hereby incorporated by reference. "A preferred embodiment of the invention provides for error detection in the data that the command station receives from the machine monitor 4. In accordance with a preferred error detection scheme, the machine monitor 4 transmits a 16-bit cyclic redundancy check (CRC) message immediately after transmitting the sensor data message." '491 patent, 16:25-30.
14. A wireless communication device for use in a communication system to communicate command and sensed data between remote wireless communication devices, the wireless communication device comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a transceiver configured to send and receive wireless communications; and	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for

	receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid

	necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824

	spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the

	RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23.
a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to format a message comprising a receiver address comprising a scalable address of at least one remote wireless device; a command indicator comprising a command code, a data value comprising a scalable message.	"The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. "The digital sensor signals are fed to a monitor computer 418, such as the Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes a data processor 420 which performs 16-bit operations with 32-bit extended registers. The monitor computer 418 also incorporates memory 422 consisting of at least 32 kilobytes of static RAM, a timer 424, a serial

	interface 426, and a battery status monitor circuit 428." '491 patent, 5:46-55. '491 patent, Figure 3. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields).

	"The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to

	individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message

	includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space.

	Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
15. The wireless communication device of claim 14, further comprising at least one sensor configured to detect a condition and output a signal to the controller.	The above contentions for claim 14 are hereby incorporated by reference. "A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each

	machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1.

	"In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses:

	"PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition

	devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

16. The wireless communication device of claim 14, wherein the controller is further configured to determine if at least one received message is a duplicate message and determine a location from which the duplicate message originated.	The above contentions for claim 14 are hereby incorporated by reference. "A preferred embodiment of the invention provides for error detection in the data that the command station receives from the machine monitor 4. In accordance with a preferred error detection scheme, the machine monitor 4 transmits a 16-bit cyclic redundancy check (CRC) message immediately after transmitting the sensor data message." '491 patent, 16:25-30.
17. The wireless communication device of claim 14, further comprising at least one actuator configured to implement an action corresponding to the command code.	The above contention for claim 14 is hereby incorporated by reference
	"Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." ''491 patent, 7:56-60. "During the setup/configuration process, the monitor 4 receives a unique monitor 4 ID number (address), a date/time synchronization by the command station 6 (current time/date), and a date/time of a monitor's first status poll. At the date/time of the first status poll, the monitor 4 will turn on its transceiver and wait to receive a status poll command." '491 patent, 12:31-37. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the

	monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20.
18. The device of claim 14, wherein the transceiver comprises a unique transceiver address to distinguish the transceiver from other transceivers.	The above contentions for claim 14 are hereby incorporated by reference. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63.
19. In a system for communicating commands and sensed data between remote devices comprising a communications device for communicating commands and sensed data, the communications device comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,907,491

	status of the machine." '491 Abstract.
a transceiver operably configured to be in communication with at least one other of a plurality of transceivers, wherein the transceiver has a unique address, wherein the unique address identities the individual transceiver, wherein the transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with each of the other transceivers via preformatted messages;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals

	containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "The basic components of the system may be configured in various ways, some of which are illustrated in FIG. 1, to meet the requirements of the particular location where the system is used. If a particular machine is located such that machine monitors 4 placed on the machine are beyond the receiving range of the command station 6, or are out of the line of sight to the command

	station 6, a properly located repeater 8 is used to receive the signals from the machine monitors and retransmit the signals to the command station 6." '491 patent 4:58-67. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent,

	15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23.

a controller configured to be in communication with the transceiver, the controller configured to provide preformatted messages for communication;	"The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,907,491

	in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,907,491

	and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable

	fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43.

	'252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is

	identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields.

	Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
wherein the preformatted message comprises at least one packet, wherein the packet comprises: a receiver address comprising a scalable address of the at least one of the intended receiving transceivers; sender address comprising the unique address of the sending transceiver; a command indicator comprising a command code; at least one data value comprising a scalable message; and an error detector comprising a redundancy check error detector; and wherein the controller is configured to interact with the transceiver to send preformatted command messages.	"Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." ''491 patent, 7:56-60. "During the setup/configuration process, the monitor 4 receives a unique monitor 4 ID number (address), a date/time synchronization by the command station 6 (current time/date), and a date/time of a monitor's first status poll. At the date/time of the first status poll, the monitor 4 will turn on its transceiver and wait to receive a status poll command." '491 patent, 12:31-37. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,907,491

	"To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

	Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number,

	and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message

	with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson:

	"FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31.

	"For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,907,491

	This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional

	Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
20. The communication device of claim 19, further comprising a sensor operatively configured to detect a condition and output a sensed data signal that corresponds to the condition to the transceiver.	The above contentions for claim 19 are hereby incorporated by reference. "A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,907,491

	35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3.

21. The communication device of claim 20, wherein the transceiver is configured to receive a preformatted command message requesting sensed data, confirms the receiver address is its own unique address, receives the sensed data signal, formats the sensed data signal into scalable byte segments, determines a number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet.	The above contentions for claim 20 are hereby incorporated by reference. "In another preferred embodiment, each machine monitor in the wireless machine monitoring system includes at least one sensor which senses a parameter of the machine and produces digital data, a wireless transmitter and receiver, and a data processor for controlling the operation of the sensor, transmitter and receiver. The monitor data processor receives and processes the digital sensor data according to a first processing configuration for communicating the digital data to the transmitted and causing the transmitter to produce transmission signals corresponding to the digital data. The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal. The system also includes means for reprogramming the monitor data processor to change the programmed processing configuration, enabling reconfiguration of the machine monitor so that data is processed according to a second process configuration. A hand-held configuration device can be used for reprogramming the monitor data processor. Alternatively, reprogramming is accomplished by the command station. The configuration device includes a wireless transmitter and receiver, and a data processor for controlling and causing the transmitter to transmit configuration signals to the monitor for reprogramming of the monitor data processor and for processing wireless signals transmitted by the monitor. A user interface is also provided for inputting user commands to the configuration

	device data processor to control reprogramming of machine monitors." '491 patent, 3:5-34. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in

	the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR,

	encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition

	devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

	In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module

	sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing

	performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network

	numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
25. A wireless communication device for use in a communication system to communicate a number of commands and sensed data between remote wireless communication devices, the wireless communication device comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a transceiver configured to send and receive wireless communications; and	"The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This

	signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23.
a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to reformat a message comprising receiver address comprising a scalable address of at least one remote wireless device; a command indicator comprising a command code; a data value comprising a scalable message.	"The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217

	patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and

	fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel

	page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses:

	"Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules

	belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39.

	"FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source

	Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,907,491

The '661 Patent – Claim	U.S. Patent No. 5,907,491
1. A system for remote data collection, assembly, storage, and event detection and reporting, comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"A command station, which includes a transceiver, is also provided to transmit wireless command signals and to receive status data through the wireless status signals." '491 patent, 2:37-39. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol." '491. 3:38-41. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol." '491 patent, 3:46-48.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,907,491

	"In accordance with a preferred embodiment of the present invention, a block diagram of a wireless monitoring system is shown in FIG. 1. … The basic components of the system include: (1) one of more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine … (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by the operator…." '491 patent, 4, 31-53. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
a plurality of transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for

	receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request

	to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,907,491

	patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN.	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage." '491 patent, 8:6-9.
5. A system for monitoring remote devices, comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 patent Abstract.

at least one sensor adapted to generate an electrical signal in response to a physical condition;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which

	transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58.
at least one wireless transmitter electrically interfaced with the sensor and configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a radio-frequency (RF) signal;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station

	includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor

	housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,907,491

	identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
one or more additional wireless transmitters each electrically interfaced with a sensor and configured to receive the RF signal and retransmit the RF signal;	"The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the

	machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4.
at least one gateway connected a wide area network (WAN) configured to receive and translate the retransmitted RF signal, the gateway further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN; and	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage."

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,907,491

a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.	"A command station, which includes a transceiver, is also provided to transmit wireless command signals and to receive status data through the wireless status signals." '491 patent, 2:37-39. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol." '491. 3:38-41. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol." '491 patent, 3:46-48. "In accordance with a preferred embodiment of the present invention, a block diagram of a wireless monitoring system is shown in FIG. 1. … The basic components of the system include: (1) one of more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine … (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by the operator…." '491 patent, 4, 31-53.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,907,491

	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
6. The system of claim 5, wherein the at least one gateway is permanently connected to the WAN.	The above contentions for claim 5 are hereby incorporated by reference. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
8. The system of claim 5, wherein the gateway translates the encoded electrical signal, the transmitter identification and the transceiver identification information into TCP/IP for communication over the WAN.	The above contentions for claim 5 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an

	extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘650 patent discloses: “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art.” ‘650 patent, 6:11-26.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,907,491

	"Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
9. A system for controlling a remote device comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.

a target remote device having an actuator to be controlled;	"In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn,

	page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51.

	U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a computer configured to execute at least one computer program that generates at least one control signal responsive to a system input signal; said	"A command station, which includes a transceiver, is also provided to transmit wireless command signals and to receive status data through the wireless status signals." '491 patent, 2:37-39.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,907,491

computer integrated with a wide area network (WAN);	"In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol." '491. 3:38-41. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol." '491 patent, 3:46-48. "In accordance with a preferred embodiment of the present invention, a block diagram of a wireless monitoring system is shown in FIG. 1. … The basic components of the system include: (1) one of more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine … (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by the operator…." '491 patent, 4, 31-53. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and

	information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
a gateway connected to the WAN configured to receive and translate the at least one control signal	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
a wireless transmitter coupled with the gateway for transmitting a wireless signal that contains the control signal;	"In accordance with a preferred embodiment of the present invention, a block diagram of a wireless monitoring system is shown in FIG. 1. … The basic components of the system include: (1) one of more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine … (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by the operator…." '491 patent, 4, 31-53.
a first wireless transceiver electrically interfaced with an actuator for receiving the wireless signal and further retransmitting the wireless signal to the target remote device; and	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each

	machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,907,491

	shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19.

	"To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63.
logic coupled to the target remote device for extracting the control signal from the retransmitted wireless signal and imparting an action on the actuator in response to the extracted control signal.	"The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as

	cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248.

	U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently

	preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
10. The system of claim 9, further comprising:	The above contentions for claim 9 are hereby incorporated by reference.
a plurality of additional wireless transceivers each coupled to an actuator and configured to receive the wireless signal and to retransmit the wireless signal, wherein one of the plurality of additional wireless transceivers receive the wireless signal from the wireless transmitter and another one of the plurality of the additional wireless transceivers retransmits the wireless signal to the first wireless transceiver.	"The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57.
11. The system of claim 9, further comprising:	The above contentions for claim 9 are hereby incorporated by reference.
a plurality of additional wireless transceivers each coupled to an actuator or a sensor and configured to receive the wireless signal and to retransmit the wireless signal, wherein one of the plurality of additional wireless transceivers receive the wireless signal from the wireless transmitter and another one of the plurality of the additional wireless transceivers retransmits the wireless signal to the	"The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which

first wireless transceiver.	transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57.
12. A system for remote data collection, assembly, storage, and event detection and reporting, comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"A command station, which includes a transceiver, is also provided to transmit wireless command signals and to receive status data through the wireless status signals." '491 patent, 2:37-39. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol." '491. 3:38-41.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,907,491

	"Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol." '491 patent, 3:46-48. "In accordance with a preferred embodiment of the present invention, a block diagram of a wireless monitoring system is shown in FIG. 1. … The basic components of the system include: (1) one of more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine … (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by the operator…." '491 patent, 4, 31-53. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
a plurality of non-earth orbiting transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station

transceiver making retransmission; and	includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor

	housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique

Exhibit P5 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,907,491

	identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN.	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage."
14. The system as defined claim 12, wherein the gateway translates the encoded electrical signal, the	The above contentions for claim 12 are hereby incorporated by reference.

transmitter identification, and the transceiver identification information into TCP/IP for communication over the WAN.	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 3. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 4. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical

	to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43.

	‘773 patent, Figure 2. The ‘817 patent discloses: “FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1.” ‘817 patent, 6:1-8.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

The '692 Patent – Claim	U.S. Patent No. 5,907,491
1. A system for remote data collection, assembly, and storage comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"A command station, which includes a transceiver, is also provided to transmit wireless command signals and to receive status data through the wireless status signals." '491 patent, 2:37-39. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol." '491. 3:38-41. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol." '491 patent, 3:46-48.

	"In accordance with a preferred embodiment of the present invention, a block diagram of a wireless monitoring system is shown in FIG. 1. … The basic components of the system include: (1) one of more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine … (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by the operator…." '491 patent, 4, 31-53. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
at least one wireless transmitter configured to transmit select information and transmitter identification information;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor

	operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine….” ‘491 patent, 2:27-35. “The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary.” ‘491 patent, 4:41-57. ‘491 patent, Figure 1. “In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine.” ‘491 patent, 5:13-18. ‘491 patent, Figure 3.

	"During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code

	to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
a plurality of relatively low-power radio-frequency (RF) transceivers dispersed geographically at defined locations configured to receive select information transmitted from at least one nearby wireless transmitter and further configured to transmit the select information, the transmitter identification information and transceiver identification information; and	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor

	operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine….” ‘491 patent, 2:27-35. “The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary.” ‘491 patent, 4:41-57. ‘491 patent, Figure 1. “In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine.” ‘491 patent, 5:13-18. ‘491 patent, Figure 3.

	"During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code

	to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
at least one gateway connected to the wide area network configured to receive and translate the select information, the transmitter identification information, and transceiver identification information, said gateway further configured to farther transmit the translated information to the computer over the WAN.	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage." '491 patent, 8:6-9.
3. The system as defined in claim 1, wherein each wireless transmitter is configured to transmit a relatively low-power, radio-frequency (RF) signal.	The above contentions for claim 1 are hereby incorporated by reference. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as

	vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency

	(RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19.
4. The system as defined in claim 1, wherein each wireless transmitter is integrated with a sensor.	The above contentions for claim 1 are hereby incorporated by reference. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57.

	'491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15.

	"The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19.
5. The system as defined in claim 1, wherein the RF signal transmitted by the receiver contains a concatenation of information comprising select information and transmitter identification information from the originating transmitter and transceiver identification information for each transceiver that receives and repeats the RF signal.	The above contentions for claim 1 are hereby incorporated by reference. "A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more

	machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more

	monitors 4." '491 patent, 7:56-58. "During the setup/configuration process, the monitor 4 receives a unique monitor 4 ID number (address), …." '491 patent, 12:31-34. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by

	the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18: 8-23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
6. The system as defined in claim 5, wherein the at least one transmitter is replaced by a transceiver, the transceiver further integrated with an actuator.	The above contentions for claim 5 are hereby incorporated by reference. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43.

	"Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
7. The system as defined in claim 6, wherein the transceivers are configured to communicate with the gateway via a RF signal.	The above contentions for claim 6 are hereby incorporated by reference. "A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at

	preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19.

	"To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
8. The system as defined in claim 7, wherein the computer is further configured to respond to received select information by communicating a control signal to at least one transceiver, wherein the actuator integrated with the transceiver is responsive to the control signal.	The above contentions for claim 7 are hereby incorporated by reference. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the

	machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
11. The system as defined in claim 1, wherein the gateway includes one selected from the group consisting of:	The above contentions for claim 1 are hereby incorporated by reference.
a modem for establishing a dial-up connection with a remote computer; a network card for communicating across a local area network; a network card for communicating across the WAN, a DSL modem; and an ISDN card to permit backup access to the computer.	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage." '491 patent, 8:6-9. '491 patent, Figure 8.
12. The system as defined in claim 1, wherein the	The above contentions for claim 1 are hereby incorporated by reference.

gateway translates the select information, the transmitter identification, and the transceiver identification information to TCP/IP for communication over the WAN.	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical

	to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43.

	'773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
13. The system as defined in claim 1, wherein the WAN is the Internet.	The above contentions for claim 1 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into

	the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘650 patent discloses: “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art.” ‘650 patent, 6:11-26. “Likewise, the APPS 112 may reside on a single DCS 100, or be distributed

	over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
14. The system as defined in claim 1, wherein the WAN is a dedicated Intranet.	The above contentions for claim 1 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example:

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses:

	"In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with

	the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
24. A method for controlling a system comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
remotely collecting data from at least one sensor;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor

	operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3.

	"During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code

	to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
processing the data into a radio-frequency (RF) signal;	"The sensor signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistorcapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by and analog-to-digital converter 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as a Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes data processor 420 which performs 16-bit operations with 32-bit extended registers." '491 patent, 5:37-52. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave

	(CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15.
transmitting the RF signal, via a relatively low-power transceiver, to a gateway;	"The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57.
translating the data in the RF signal into a network transfer protocol;	"A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4. The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converter circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64.
sending the translated data to a computer, wherein	"A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4. The

the computer is configured to appropriately respond to the data generated by the at least one sensor by generating an appropriate control signal;	RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converter circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64. "A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage. The PC network 10 also enables an operator to reformat the time slice schedule 18 of FIG. 9. For example, the time slice schedule 18 can be reformatted by

	changing the order of devices within the schedule 18, changing the length of time allotted to individual slices, and changing the frequency at which status polls will be conducted." '481 patent, 8:6-15.
sending the control signal via the network to the gateway,	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage. The PC network 10 also enables an operator to reformat the time slice schedule 18 of FIG. 9. For example, the time slice schedule 18 can be reformatted by changing the order of devices within the schedule 18, changing the length of time allotted to individual slices, and changing the frequency at which status polls will be conducted." '481 patent, 8:6-15. "A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4. The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converter circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64.
translating the control signal from a network transfer protocol into an RF control signal;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor

	incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract.
transmitting the RF control signal;	"Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling. For example, if a particular machine is suspected of having an anomalous condition, it might be useful to instruct that machine's monitors 4 to begin collecting sand storing specific types of data for specific types of analysis, such as vibration time waveform data for zoom processing. The monitor computer 418 can also be programmed or otherwise requested to perform the zoom processing itself and store only the results of the zoom processing for later transmission to the command station." '491 patent, 7:56-8:2.
receiving the RF control signal;	"The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4. The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converter circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station

	computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64.
translating the received RF control signal into an analog signal; and	"A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4. The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converter circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64.
applying the analog signal to an actuator to effect the desired system response.	"A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4. The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converter circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform

	special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
25. The method of claim 24, wherein the RF signal contains a concatenation of information comprising encoded data information and transmitter identification information from an originating transmitter.	The above contentions for claim 24 are hereby incorporated by reference. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The

	identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
26. The method of claim 25, wherein the step of transmitting the RF signal is further performed by at least one transceiver, wherein the transceiver is configured to concatenate a transceiver identification code to the RF signal.	The above contentions for claim 25 are hereby incorporated by reference. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The sensor signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistorcapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	format by and analog-to-digital converter 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as a Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes data processor 420 which performs 16-bit operations with 32-bit extended registers." '491 patent, 5:37-52. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
27. The method of claim 25, wherein the step of transmitting the RF control signal is further performed by at least one transceiver, wherein the transceiver is configured to receive and transmit the RF control signal.	The above contentions for claim 25 are hereby incorporated by reference. "The sensor signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	anti-aliasing filter 414, such as a simple resistorcapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by and analog-to-digital converter 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as a Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes data processor 420 which performs 16-bit operations with 32-bit extended registers." '491 patent, 5:37-52. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19.
28. The method of claim 25, wherein the steps of translating and applying the received RF control signal are performed only by an identified transceiver electrically integrated with an actuator.	The above contentions for claim 25 are hereby incorporated by reference. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the

	monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36
29. The method of claim 25, wherein the network is the Internet.	The above contentions for claim 25 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses:

	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112.

	However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
30. The method of claim 25, wherein the network is an Intranet.	The above contentions for claim 25 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249.

	Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses:

	"Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
31. The method of claim 25, wherein the network transfer protocol is TCP/IP.	The above contentions for claim 25 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses:

	"When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors

	110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art.” ‘650 patent, 6:11-26. “Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers.” ‘650 patent, 8:42-44. “For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112.” ‘650 patent, 10:54-57. The ‘773 patent discloses: “Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." ‘773 patent, 7:39-43. ‘773 patent, Figure 2. The ‘817 patent discloses: “FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1.” ‘817 patent, 6:1-8.

32. A system for monitoring remote devices comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
at least one sensor adapted to generate an electrical signal in response to a physical condition;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35.

	"The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34.

	"Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor

	data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
at least one wireless transmitter configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a low-power radio-frequency (RF) signal;	"The sensor signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistorcapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by and analog-to-digital converter 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as a Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes data processor 420 which performs 16-bit operations with 32-bit extended registers." '491 patent, 5:37-52. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15.
at least one gateway connected a wide area network	"The command station 6 can be connected to a PC network 10 as shown in

(WAN) configured to receive and translate the RF signal, the gateway further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN; and	FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage." '491 patent, 8:6-9. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250.

	"Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.	"A command station, which includes a transceiver, is also provided to transmit wireless command signals and to receive status data through the wireless status signals." '491 patent, 2:37-39. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "Wireless command signals are transmitted from a command station to the

	monitors according to the communication protocol." '491. 3:38-41. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol." '491 patent, 3:46-48. "In accordance with a preferred embodiment of the present invention, a block diagram of a wireless monitoring system is shown in FIG. 1. … The basic components of the system include: (1) one of more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine … (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by the operator…." '491 patent, 4, 31-53. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
34. The system defined in claim 32, wherein each wireless transmitter is configured to transmit a relatively low-power radio-frequency (RF) signal.	The above contentions for claim 32 are hereby incorporated by reference. "A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information,

	and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1.

	"In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the

	form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
36. The system defined in claim 32, wherein the gateway translates the encoded electrical signal, the transmitter identification, and the transceiver identification information into TCP/IP for communicating over the WAN.	The above contentions for claim 32 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this

	limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses:

	"In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses:

	"FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
37. The system defined in claim 32, wherein the WAN in the Internet.	The above contentions for claim 32 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. …

	2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44.

	"For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
38. The system defined in claim 32, wherein the WAN is a dedicated Intranet.	The above contentions for claim 32 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses:

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112.

	However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
42. A system for controlling remote devices comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a computer configured to execute at least one computer program that generates at least one control signal responsive to a system input signal; said computer integrated with a wide area network (WAN);	"A command station, which includes a transceiver, is also provided to transmit wireless command signals and to receive status data through the wireless status signals." '491 patent, 2:37-39. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol." '491. 3:38-41. "Another preferred method provides for periodically polling a plurality of

	machine monitors for machine status data in accordance with an established communication protocol." '491 patent, 3:46-48. "In accordance with a preferred embodiment of the present invention, a block diagram of a wireless monitoring system is shown in FIG. 1. … The basic components of the system include: (1) one of more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine … (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by the operator…." '491 patent, 4, 31-53. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
at least one gateway connected to the WAN configured to receive and translate the at least one control signal; said gateway further configured to transmit a radio-frequency (RF) signal containing the control signal and destination information;	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage." '491 patent, 8:6-9. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet

	gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP

	112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent,

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	6:1-8.
at least one wireless low-power RF transceiver configured to receive the RF signal from the gateway; said wireless transceiver configured to translate the RF signal to an analog output signal, the wireless transceiver electrically coupled with an actuator; and	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the

	monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of

	a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine

	monitors 4." "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
an actuator configured to receive the analog output signal from the wireless transceiver, the actuator	"In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform

further configured to translate the analog output signal into a response.	special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
43. The system defined in claim 42, the system input signal comprising:	The above contentions for claim 42 are hereby incorporated by reference.
a concatenation of information including data from a sensor, transceiver identification information from the originating transceiver, and transceiver identification information for each transceiver that	"To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The

receives and repeats the RF signal.	identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
46. The system defined in claim 42, wherein the gateway translates the RF signal and the RF control signal into TC/IP for communication over the WAN.	The above contentions for claim 42 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a

	person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2.

	The ‘817 patent discloses: “FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1.” ‘817 patent, 6:1-8.
47. The system defined in claim 42, wherein the WAN is the Internet.	The above contentions for claim 42 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the ‘491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the ‘491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: “The PRNET can also be accessed from other networks via an Internet gateway.” Jubin page 23. Burchfiel discloses: “When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into

	the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘650 patent discloses: “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art.” ‘650 patent, 6:11-26. “Likewise, the APPS 112 may reside on a single DCS 100, or be distributed

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
48. The system defined in claim 42, wherein the WAN is a dedicated Intranet.	The above contentions for claim 42 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses:

	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112.

	However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
49. A system for managing an arrangement of application specific remote devices comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a computer configured to execute a multiplicity of computer programs, each computer program executed to generate at least one control signal in response to at least one application system input, said computer integrated with a wide area network (WAN);	"A command station, which includes a transceiver, is also provided to transmit wireless command signals and to receive status data through the wireless status signals." '491 patent, 2:37-39. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol." '491. 3:38-41. "Another preferred method provides for periodically polling a plurality of

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	machine monitors for machine status data in accordance with an established communication protocol." '491 patent, 3:46-48. "In accordance with a preferred embodiment of the present invention, a block diagram of a wireless monitoring system is shown in FIG. 1. … The basic components of the system include: (1) one of more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine … (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by the operator…." '491 patent, 4, 31-53. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
at least one gateway connected to the WAN configured as a two-way communication device to receive and translate the at least one control signal and the at least one application system input; said gateway further configured to translate and transmit a radio-frequency (RF) signal containing the control signal and destination information, said gateway further configured to receive and translate the at least one application system input and source information;	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage." '491 patent, 8:6-9. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage. The PC network 10 also enables an operator to reformat the time slice schedule 18 of FIG. 9. For example, the time slice schedule 18 can be reformatted by changing the order of devices within the schedule 18, changing the length of time allotted to individual slices, and changing the frequency at which status polls will be conducted." '491 patent, 8:6-15.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical

	to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43.

	'773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
at least one wireless relatively low-power RF transceiver per computer program configured to receive the RF signal from the gateway; said wireless transceiver configured to translate the RF signal to an analog output signal, the wireless transceiver electrically coupled with an actuator and a sensor;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-

	35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions

	for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF

	sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time

	slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
an actuator configured to receive the analog output signal from the wireless transceiver, the actuator further configured to translate the analog output signal into a response; and	"In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61.

	"Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
a sensor configured to translate a physical condition into an analog version of the application system input.	"Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57.

	'491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15.

	"The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
51. The system as defined in claim 49, wherein the at least one gateway translates the RF signal and the RF control signal into TCP/IP for communication over the WAN.	The above contentions for claim 49 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a

	person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.

	The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
52. The system as defined in claim 49, wherein the WAN in the Internet.	The above contentions for claim 49 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the

	destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘650 patent discloses: “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art.” ‘650 patent, 6:11-26. “Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers.” ‘650 patent, 8:42-44.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	"For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
53. The system as defined in claim 49, wherein the WAN is a dedicated Intranet.	The above contentions for claim 49 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses:

	"The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112.

	However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
54. The system as defined in claim 49, wherein the at least one gateway is connected to the WAN by a network selected from the group consisting of a telecommunications network, private radio-frequency network, and a computer network.	The above contentions for claim 49 are hereby incorporated by reference. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
55. A method of collecting information and providing data services comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
adaptively configuring a data translator at the output of a local controller, wherein the data translator converts the output data stream into an information signal consisting of a transmitter code and an information field;	"The sensor signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistorcapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by and analog-to-digital converter 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as a Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes data processor 420 which performs 16-bit operations with 32-bit extended registers." '491 patent, 5:37-52.

	"As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15.
adaptively configuring at least one transmitter with the data translator, wherein the transmitter converts the information signal into a low-power RF signal;	"The sensor signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistorcapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by and analog-to-digital converter 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as a Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes data processor 420 which performs 16-bit operations with 32-bit extended registers." '491 patent, 5:37-52. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15.

placing a plurality of relatively low-power radio-frequency (RF) transceivers dispersed geographically wherein the low power RF signal is received and repeated as required to communicate the information signal to a gateway, the gateway providing access to a WAN;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,907,491

	monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data

	reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a

	similar fashion when relaying data from the command station 6 to the machine monitors 4." "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
translating the low-power RF signal within the gateway to a WAN compatible data transfer protocol;	"A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4. The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converter circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64.
transferring the translated low-power RF signal via the WAN to a computer wherein the computer is configured to manipulate and store data provided in said signal; and	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.
granting client access to the computer.	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage. The PC network 10 also enables an operator to reformat the time slice schedule 18 of FIG. 9. For example, the time slice schedule 18 can be reformatted by changing the order of devices within the schedule 18, changing the length of time allotted to individual slices, and changing the frequency at which status polls will be conducted." '481 patent, 8:6-15.

56. The method of claim 55 wherein the WAN is the Internet.	The above contentions for claim 55 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250.

	"Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2.

	Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
57. The method of claim 55 wherein the WAN is an Intranet.	The above contentions for claim 55 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways:

	1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘650 patent discloses: “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a

	form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
59. The method of claim 55 wherein the clients access the information using a web browser.	The above contentions for claim 55 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed

	explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote

	ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2.

	The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
60. A method for controlling an existing control system with a local controller comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
adaptively configuring a data translator disposed between and in communication with both a local controller and a wireless transceiver, wherein the data translator is configured to translate the local controller data stream into an information signal consisting of a transceiver identification code and a concatenation of function codes, the data translator further configured to translate control signals from the wireless transceiver into local controller recognized control signals;	"The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when

	site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "The sensor signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistorcapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by and analog-to-digital converter 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as a Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes data processor 420 which performs 16-bit operations with 32-bit extended registers." '491 patent, 5:37-52. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the

	antenna 406." '491 patent, 15:6-15. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a

	person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
remotely collecting data from the at least one relatively low-powered radio-frequency (RF) transceiver integrated with the data translator;	"Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an

	operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an

	RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."

processing the data into an RF signal;	"The sensor signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistorcapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by and analog-to-digital converter 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as a Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes data processor 420 which performs 16-bit operations with 32-bit extended registers." '491 patent, 5:37-52. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15.
transmitting the RF signal to a gateway;	"The sensor signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistorcapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by and analog-to-digital converter 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as a Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes data processor 420 which performs 16-bit operations with 32-bit extended registers." '491 patent, 5:37-52.

	"As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15.
translating the data in the RF signal into a network transfer protocol;	"A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4. The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converter circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64.
sending the translated data to a computer, wherein the computer is configured to appropriately respond to the data generated by at least one sensor by generating an appropriate control signal;	"A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4. The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converter circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64.

	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage. The PC network 10 also enables an operator to reformat the time slice schedule 18 of FIG. 9. For example, the time slice schedule 18 can be reformatted by changing the order of devices within the schedule 18, changing the length of time allotted to individual slices, and changing the frequency at which status polls will be conducted." '481 patent, 8:6-15.
sending the control signal via the network to the gateway;	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage. The PC network 10 also enables an operator to reformat the time slice schedule 18 of FIG. 9. For example, the time slice schedule 18 can be reformatted by changing the order of devices within the schedule 18, changing the length of time allotted to individual slices, and changing the frequency at which status polls will be conducted." '481 patent, 8:6-15. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established

	communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
translating the control signal from a network transfer protocol into an RF control signal;	"In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors,

	receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
transmitting the RF control signal;	"In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to

	receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
receiving the RF control signal;	"The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4. The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converter circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64.
translating the received RF control signal into a local controller recognized control signal; and	"A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4. The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converter circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend

	analysis." '491 patent, 15:51-64.
applying the local controller recognized control signal via a local control to effect the desired system response.	"A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4. The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converter circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or

	more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
61. The method of claim 60, wherein the step of transmitting the RF control signal is further performed by at least one transceiver, wherein the transceiver is configured to receive and transmit the RF control signal.	The above contentions for claim 60 are hereby incorporated by reference. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication

	between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003,

	which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63.
62. The method of claim 60, wherein the network is the Internet.	The above contentions for claim 60 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections

	between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘650 patent discloses: “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116.

	Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
63. The method of claim 60, wherein the network is an Intranet.	The above contentions for claim 60 are hereby incorporated by reference.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical

	to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '650 patent discloses: "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43.

	'773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
64. The method of claim 60, wherein the network transfer protocol is TCP/IP.	The above contentions for claim 60 are hereby incorporated by reference. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an

	extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘650 patent discloses: “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art.” ‘650 patent, 6:11-26.

	"Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 5,907,491

The '732 Patent – Claim	U.S. Patent No. 5,907,491
1. A system for remote data collection, assembly, storage, event detection and reporting and control, comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"A command station, which includes a transceiver, is also provided to transmit wireless command signals and to receive status data through the wireless status signals." '491 patent, 2:37-39. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol." '491. 3:38-41. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol." '491 patent, 3:46-48.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 5,907,491

	"In accordance with a preferred embodiment of the present invention, a block diagram of a wireless monitoring system is shown in FIG. 1. … The basic components of the system include: (1) one of more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine … (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by the operator…." '491 patent, 4, 31-53. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol

	congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘650 patent discloses: “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to

	implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
a plurality of transceivers dispersed geographically at defined locations, each transceiver electrically inter- faced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained

predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission;	during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57.

	'491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15.

	"The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage." '491 patent, 8:6-9.

with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN and wherein at least one of said plurality of transceivers is also electrically interfaced with an actuator to control an actuated device.	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control

	process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control."

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 5,907,491

	'817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
13. In a system comprising a plurality of wireless devices configured for remote wireless communication and comprising a device for monitoring and controlling remote devices, the device comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from another wireless transceiver in a predetermined signal type;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication

	protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is

	integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19.

	"To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 5,907,491

	similar fashion when relaying data from the command station 6 to the machine monitors 4."
a data controller operatively coupled to the transceiver and the sensor, the data controller configured to control the transceiver and receive data from the sensor, the data controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.	"The sensor data signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistocapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by an analog-to-digital converted 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as the Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes a data processor 420 which performs 16-bit operations with 32-bit extended registers." '491 patent, 5:36-52. '491 patent, Figure 3.
14. The device of claim 13, wherein the data controller is configured to receive data packets comprising control signals and in response to the control signals provide a control signal to an actuator for implementation of a command.	The above contentions for claim 13 are hereby incorporated by reference. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 5,907,491

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control

	process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control."

	'817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
16. The device of claim 13**,** wherein the data controller is configured to receive data packets comprising a function code, and in response to the function code, implement a function.	The above contentions for claim 13 are hereby incorporated by reference. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a

	person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247.

	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2.

	U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
17. The device of claim 13**,** wherein the data controller is configured to format data packets for transmission via the transceiver, the data packets comprising a function code corresponding to sensed data and the unique identification code	The above contentions for claim 13 are hereby incorporated by reference. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
18. The device of claim 13, further comprising a memory to store one or more function codes corresponding to the device, the function codes	The above contentions for claim 13 are hereby incorporated by reference. "In addition to those functions performed according to the communication

corresponding to a number of functions the data controller can implement.	protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "The sensor data signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistocapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by an analog-to-digital converted 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as the Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes a data processor 420 which performs 16-bit operations with 32-bit extended registers. The monitor computer 418 also incorporates memory 422 consisting of at least 32 kilobytes of static RAM, a timer 424, a serial interface 426, and a battery status monitor circuit 428." '491 patent, 5:36-55. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.
19. The device of claim 13, further comprising an actuator configured to receive command data from the controller and in response implement the	The above contentions for claim 13 are hereby incorporated by reference. "In addition to those functions performed according to the communication

command.	protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

	Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses:

	"The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
31. A wireless communication system including wireless communication devices capable of wireless communication, the wireless communication system	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8,013,732 based on U.S. Patent No. 5,907,491

comprising:	command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
at least one wireless communication device comprising a transceiver, the transceiver having a unique identification code and being interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from another wireless transceiver in a predetermined signal type;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as

	vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency

	(RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the

	repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4."
a controller operatively coupled to the transceiver and the sensor, the controller configured to control transceiver operations and receive data from the sensor, the controller configured to format data packets for transmission via the transceiver with at least some data packets comprising data representative of data sensed with the sensor; and	"The sensor data signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistocapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by an analog-to-digital converted 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as the Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes a data processor 420 which performs 16-bit operations with 32-bit extended registers." '491 patent, 5:36-52. '491 patent, Figure 3.
wherein the controller is configured to receive control signals from a data packet and based on the control signals send instructions to an actuator to implement a command.	"In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a

	person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247.

	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2.

	U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
32. The wireless communication system of claim 31**,** further comprising at least one gateway connected to a WAN configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to a computing device over the WAN.	The above contentions for claim 31 are hereby incorporated by reference. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station 6 is able to transfer data and information directly to the PC network for analysis and archival storage." '491 patent, 8:6-9. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections

	between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘650 patent discloses: “In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116.

	Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
33. The wireless communication system of claim	The above contentions for claim 31 are hereby incorporated by reference.

31, further comprising a computing device configured to receive user input and based on user input, the computing device formatting control signals, and wherein the controller is configured to receive the control signals via wireless transmission and take action based on the control signals.	"In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn,

	page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: “PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator.” Jubin page 23. “A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging.” Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: “The “function fields” provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process.” Burchfiel page 247. “A level-3 debugging protocol has been defined which supports debugging of remote PRU’s from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting “mousetraps” which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure.” Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: “Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices.” ‘650 patent, 5:46-51.

	U.S. Patent No. 7,027,773 discloses: “The Data portion of a MinionNet network Standard Message with a Type Code meaning “Command” will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network.” ‘773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: “In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control.” ‘817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: “Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements.” ‘903, 4:23-31.
34. The wireless communication system of claim 31, wherein the controller is configured to provide one or more function codes in the data packet in	The above contentions for claim 31 are hereby incorporated by reference. “In addition to those functions performed according to the communication

response to data sensed by the sensor.	protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

	Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses:

	"The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
35. The wireless communication system of claim 31, wherein the controller comprises a memory containing a plurality of function codes specific to	The above contentions for claim 31 are hereby incorporated by reference. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform

the sensor.	special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "The sensor data signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistocapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by an analog-to-digital converted 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as the Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes a data processor 420 which performs 16-bit operations with 32-bit extended registers. The monitor computer 418 also incorporates memory 422 consisting of at least 32 kilobytes of static RAM, a timer 424, a serial interface 426, and a battery status monitor circuit 428." '491 patent, 5:36-55. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 5,907,491

The '780 Patent – Claim	U.S. Patent No. 5,907,491
1. In a system comprising a plurality of wireless devices, a device comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from a second wireless transceiver in a predetermined signal type;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned

	to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is

	accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding

	messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 5,907,491

the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the second wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23.
a controller operatively coupled to the transceiver and the sensor, the controller configured to control the transceiver and receive data from the sensor, the controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.	"The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is

	accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. "The digital sensor signals are fed to a monitor computer 418, such as the Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes a data processor 420 which performs 16-bit operations with 32-bit extended registers. The monitor computer 418 also incorporates memory 422 consisting of at least 32 kilobytes of static RAM, a timer 424, a serial interface 426, and a battery status monitor circuit 428." '491 patent, 5:46-55. '491 patent, Figure 3.
2. The device of claim 1, wherein the controller is configured to receive data packets comprising control signals and in response to the control signals provide a control signal to an actuator for implementation of a command.	The above contentions for claim 1 are hereby incorporated by reference. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4

	milliseconds." '491 patent, 8:32-36. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging."

	Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device

	and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
4. The device of claim 1, wherein the controller is configured to receive data packets comprising a function code, and in response to the function code, implement a function.	The above contentions for claim 1 are hereby incorporated by reference. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51.

	"Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

	Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 5,907,491

	or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data,

	functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
5. The device of claim 1, wherein the controller is configured to format data packets for transmission via the transceiver, the data packets comprising a function code corresponding to sensed data and the unique identification code that identifies the transceiver.	The above contentions for claim 1 are hereby incorporated by reference. "A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-

	35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a

	status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor

	transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host

	computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51.

	U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

6. The device of claim 1, further comprising a memory to store one or more function codes corresponding to the device, the function codes corresponding to a number of functions the controller can implement.	The above contentions for claim 1 are hereby incorporated by reference. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "The sensor data signals are amplified by an amplifier 412, such as a digitally controlled variable gain amplifier incorporating a chip of type number LM6684. The sensor signals are filtered to

	eliminate aliasing by means of an anti-aliasing filter 414, such as a simple resistocapacitor (RC) low-pass filter or a two-pole Sallen-Key active filter, and are then converted into digital format by an analog-to-digital converted 416, such as a 16-bit Sigma-Delta converter of type number CS5330. The digital sensor signals are fed to a monitor computer 418, such as the Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes a data processor 420 which performs 16-bit operations with 32-bit extended registers. The monitor computer 418 also incorporates memory 422 consisting of at least 32 kilobytes of static RAM, a timer 424, a serial interface 426, and a battery status monitor circuit 428." '491 patent, 5:36-55. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19.
7. The device of claim 1, further comprising an actuator configured to receive command data from the controller and in response implement a command.	The above contentions for claim 1 are hereby incorporated by reference. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8,754,780 based on U.S. Patent No. 5,907,491

	"Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below.

	For example, Kahn, which is also directed to the PRNET, discloses: “From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated.” Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: “PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator.” Jubin page 23. “A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging.” Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: “The “function fields” provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process.” Burchfiel page 247. “A level-3 debugging protocol has been defined which supports debugging of remote PRU’s from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting “mousetraps”

	which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2.

	U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
8. The device of claim 1, wherein the second transceiver is nearby to the transceiver.	The above contentions for claim 1 are hereby incorporated by reference. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8.908,842 based on U.S. Patent No. 5,907,491

The '842 Patent – Claim	U.S. Patent No. 5,907,491
1. A device for communicating information, the device comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a low-power transceiver configured to wirelessly transmit a signal comprising instruction data for delivery to a network of addressable devices;	"A command station, which includes a transceiver, is also provided to transmit wireless command signals and to receive status data through the wireless status signals." '491 patent, 2:37-39. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol." '491. 3:38-41.

	"Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol." '491 patent, 3:46-48. "In accordance with a preferred embodiment of the present invention, a block diagram of a wireless monitoring system is shown in FIG. 1. … The basic components of the system include: (1) one of more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine … (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by the operator…." '491 patent, 4:31-53. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8. "A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4 The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converted circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a

	serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64. '491 patent, Figure 4.
an interface circuit for communicating with a central location; and	"The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4 The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converted circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64. '491 patent, Figure 4.
a controller coupled to the interface circuit and to the low-power transceiver, the controller configured to establish a communication link between at least one device in the network of	"The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to

addressable devices and the central location using an address included in the signal, the communication link comprising one or more devices in the network of addressable, the controller further configured to receive one or more signals via the low-power transceiver and communicate information contained within the signals to the central location.	receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4 The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converted circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base

	for off-line trend analysis." '491 patent, 15:51-64. '491 patent, Figure 4.
7. The device of claim 1, wherein the controller is further configured to communicate a transceiver identification code to the central location via the interface circuit.	The contentions for claim 1 are hereby incorporated by reference. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8. "Each device receives its own status poll message from the command station 6. Sensors, such as tachometers 5a-c respond immediately to the status poll message, typically in less than 4 milliseconds." '491 patent, 8:32-36. "During the setup/configuration process, the monitor 4 receives a unique monitor 4 ID number (address), …." '491 patent, 12:31-33. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63.

9. The device of claim 1, wherein transmitted and received signals further comprise a field configured to indicate a destination device for a subsequent transmission path to follow.	The contentions for claim 1 are hereby incorporated by reference. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63.
16. A device for communicating information, the device comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8.908,842 based on U.S. Patent No. 5,907,491

	more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a processor; and	"A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4 The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converted circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64. '491 patent, Figure 4.
a memory, the memory comprising logical instructions that when executed by the processor are configured to cause the device to:	"A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4 The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converted circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a

	personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64. '491 patent, Figure 4.
wirelessly transmit a signal comprising instruction data for delivery to a network of addressable low-power transceivers;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
establish a communication link between at least one low-power transceiver in the network of addressable low-power transceivers and a central location based on an address included in the signal, the communication link comprising one or more low-power transceivers in the network of addressable low-power transceivers; and	"A command station, which includes a transceiver, is also provided to transmit wireless command signals and to receive status data through the wireless status signals." '491 patent, 2:37-39. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8.908,842 based on U.S. Patent No. 5,907,491

	"A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4 The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converted circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64. '491 patent, Figure 4.
receive one or more low-power RF signals and communicate information contained within the signals to the central location along with a unique transceiver identification number over the communication link.	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.

17. A device for communicating information, the device comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a low-power transceiver that is configured to wirelessly receive a signal including an instruction data from a remote device;	"A command station, which includes a transceiver, is also provided to transmit wireless command signals and to receive status data through the wireless status signals." '491 patent, 2:37-39. "In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol." '491. 3:38-41. "Another preferred method provides for periodically polling a

	plurality of machine monitors for machine status data in accordance with an established communication protocol." '491 patent, 3:46-48. "In accordance with a preferred embodiment of the present invention, a block diagram of a wireless monitoring system is shown in FIG. 1. … The basic components of the system include: (1) one of more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine … (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by the operator…." '491 patent, 4:31-53. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8. "A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4 The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converted circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or

	equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64. '491 patent, Figure 4.
an interface circuit for communicating with a central location;	"The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18. "A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4 The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converted circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64. '491 patent, Figure 4.
a controller coupled to the interface circuit and to the low-power transceiver, the controller being configured to establish a communication link between the remote device and the central location using address-indicative data included in the signal;	"The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal." '491 patent, 3:13-18.

	"The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "A block diagram of the command station 6 of FIG. 1 is shown in FIG. 4 The RF signal transmitted from the machine monitor 4 is received by an antenna 602 at the command station 6. A transceiver 604, which includes an RF power amplifier/down-converted circuit 606 and a modulator/demodulator circuit 608, such as those previously discussed in the description of the machine monitor 4, downconverts and demodulates the RF signal to recover the digital sensor data. The sensor data is fed over a serial interface 610 to a command station computer 612, such as a personal computer incorporating a Pentium processor or equivalent, where the information is preferably monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis." '491 patent, 15:51-64.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 8.908,842 based on U.S. Patent No. 5,907,491

	'491 patent, Figure 4.
the controller further configured to receive one or more data signals from the central location via the interface circuit and communicate information contained within the signals to the remote device.	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract. "The command station 6 can be connected to a PC network 10 as shown in FIG. 8. When so connected, the command station is able to transfer data and information directly to the PC network 10 for analysis and archival storage." '491 patent, 8:6-9 and FIG. 8.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

The '893 Patent – Claim	U.S. Patent No. 5,907,491
1. A system for communicating commands and sensed data between remote devices, the system comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract
a plurality of transceivers, each transceiver being in communication with at least one other of the plurality of transceivers, wherein each transceiver has a unique address, wherein the unique address identities an individual transceiver, wherein each transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with the other transceivers via preformatted messages;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor

	includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is

	fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to

	the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23.

a controller, connected to one of the plurality of transceivers, the controller being in communications with each of the plurality of transceivers via a controller transceiver, the controller communicating via preformatted messages;	"The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. "The digital sensor signals are fed to a monitor computer 418, such as the Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes a data processor 420 which performs 16-bit operations with 32-bit extended registers. The monitor computer 418 also incorporates memory 422 consisting of at least 32 kilobytes of static RAM, a timer 424, a serial interface 426, and a battery status monitor circuit 428." '491 patent, 5:46-55. '491 patent, Figure 3.
wherein the preformatted messages comprises at least one packet, wherein the packet comprises:	"To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor 4 transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet." '491 patent, 16:50-54.

a receiver address comprising a scalable address of the at least one of the intended receiving transceivers;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. '491 patent, 7:25-38. '491 patent, Figure 8. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20.

	"During the setup/configuration process, the monitor 4 receives a unique monitor 4 ID number (address), a date/time synchronization by the command station 6 (current time/date), and a date/time of a monitor's first status poll. At the date/time of the first status poll, the monitor 4 will turn on its transceiver and wait to receive a status poll command." '491 patent, 12:31-36. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor 4 transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet." '491 patent, 16:50-54. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device.

	It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25.

	"The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A

	tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing:

	Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
sender address comprising the unique address of the sending transceiver;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are

	programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. '491 patent, 7:25-38. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20.
a command indicator comprising a command code;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. '491 patent, 7:25-38. "Special requests for data sensing, data analysis, data

	transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor 4 transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet." '491 patent, 16:50-54. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S.

	Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports

	debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater

	functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
at least one data value comprising a scalable message; and	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum to reduce the length of time required to complete the time slice

	schedule 18. ‘491 patent, 7:25-38. “During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity.” To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the ‘491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the ‘491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *“A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header

	and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43.

	'252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

	service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP

	addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector comprising a redundancy check error detector; and	"A preferred embodiment of the invention provides for error detection in the data that the command station receives from the machine monitor 4. In accordance with a preferred error detection scheme, the machine monitor 4 transmits a 16-bit cyclic redundancy check (CRC) message immediately after transmitting the sensor data message." '491 patent, 16:25-30.
wherein the controller sends preformatted command messages via the controller transceiver, and the plurality of transceivers send	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

preformatted response messages.	tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. '491 patent, Figure 8.
2. The system of claim 1, wherein the plurality of transceivers further comprise at least one integrated transceiver, wherein the integrated transceiver comprises:	The above contentions for claim 1 are hereby incorporated by reference. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3.
one of the plurality of transceivers; and	"In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

	sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine. … The machine monitor 4 has connectors 410 so that one or more sensors 408 may be interfaced with the data processing and transmission circuitry of the machine monitor 4." '491 patent, 5:13-24. '491 patent, Figure 3.
a sensor detecting a condition and outputting a sensed data signal to the transceiver.	"In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine. … The machine monitor 4 has connectors 410 so that one or more sensors 408 may be interfaced with the data processing and transmission circuitry of the machine monitor 4." '491 patent, 5:13-24. '491 patent, Figure 3.
3. The system of claim 2, wherein the at least one integrated transceiver receives the preformatted command message requesting sensed data, confirms the receiver address as its own unique address, receives the sensed data signal, formats the sensed data signal into scalable byte segments, determines a number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet, wherein the packets are equal to the number of segments.	The above contentions for claim 2 are hereby incorporated by reference. "FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the

	command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. '491 patent, Figure 8. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

	ETE Header: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43.

	'252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition

	to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing:

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

	Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
10. The system of claim 1, wherein the plurality of transceivers further comprise at least one actuated transceiver, wherein the actuated transceiver comprises:	The above contentions for claim 1 are hereby incorporated by reference. "In another preferred embodiment, each machine monitor in the wireless machine monitoring system includes at least one sensor which senses a parameter of the machine and produces digital data, a wireless transmitter and receiver, and a data processor for controlling the operation of the sensor, transmitter and receiver.

	The monitor data processor receives and processes the digital sensor data according to a first processing configuration for communicating the digital data to the transmitted and causing the transmitter to produce transmission signals corresponding to the digital data. The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal; and produce received digital data corresponding to the transmission signal. The system also includes means for reprogramming the monitor data processor to change the programmed processing configuration, enabling reconfiguration of the machine monitor so that data is processed according to a second process configuration." '491 patent, 3:5-23.
one of the plurality of transceivers;	"In addition to those functions performed according to the communication protocol, monitors may be requested by the command station to perform special data sensing, analysis, and transmission functions." '491 patent, 2:47-51. "In another preferred embodiment, each machine monitor in the wireless machine monitoring system includes at least one sensor which senses a parameter of the machine and produces digital data, a wireless transmitter and receiver, and a data processor for controlling the operation of the sensor, transmitter and receiver. The monitor data processor receives and processes the digital sensor data according to a first processing configuration for communicating the digital data to the transmitted and causing the transmitter to produce transmission signals corresponding to the digital data. The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated

	circuitry to receive a transmission signal; and produce received digital data corresponding to the transmission signal. The system also includes means for reprogramming the monitor data processor to change the programmed processing configuration, enabling reconfiguration of the machine monitor so that data is processed according to a second process configuration." '491 patent, 3:5-23. "Wireless command signals are transmitted from a command station to the monitors according to the communication protocol. A characteristic of the machine being monitored is sensed in accordance with the communication protocol, producing sensor signals." '491 patent, 3:38-43. "Another preferred method provides for periodically polling a plurality of machine monitors for machine status data in accordance with an established communication protocol. The method includes the steps of defining a time-division schedule of events to occur during a periodic polling sequence. Schedule events include transmitting wireless command signals from a command station to other communication devices including machine monitors, receiving wireless command signals by the machine monitors, sensing one or more characteristics of the machine to produce sensor signals, and transmitting wireless status signals to the command station. Each device is assigned a time slice within the time-division schedule during which the device powers up to receive and execute commands communicated by the command signals." '491 patent, 3:46-61.
a sensor detecting a second condition and outputting a sensed data signal to the transceiver; and	"In another preferred embodiment, each machine monitor in the wireless machine monitoring system includes at least one sensor

	which senses a parameter of the machine and produces digital data, a wireless transmitter and receiver, and a data processor for controlling the operation of the sensor, transmitter and receiver. The monitor data processor receives and processes the digital sensor data according to a first processing configuration for communicating the digital data to the transmitted and causing the transmitter to produce transmission signals corresponding to the digital data. The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received digital data corresponding to the transmission signal. The system also includes means for reprogramming the monitor data processor to change the programmed processing configuration, enabling reconfiguration of the machine monitor so that data is processed according to a second process configuration." '491 patent, 3:5-23.
an actuator controlling a third condition and receiving control signals from the transceiver.	"In another preferred embodiment, each machine monitor in the wireless machine monitoring system includes at least one sensor which senses a parameter of the machine and produces digital data, a wireless transmitter and receiver, and a data processor for controlling the operation of the sensor, transmitter and receiver. The monitor data processor receives and processes the digital sensor data according to a first processing configuration for communicating the digital data to the transmitted and causing the transmitter to produce transmission signals corresponding to the digital data. The command station includes a receiver and associated circuitry for producing received digital data, and a data processor for controlling and causing the receiver and associated circuitry to receive a transmission signal and produce received

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

	digital data corresponding to the transmission signal. The system also includes means for reprogramming the monitor data processor to change the programmed processing configuration, enabling reconfiguration of the machine monitor so that data is processed according to a second process configuration." '491 patent, 3:5-23.
17. A system for communicating commands and sensed data between remote devices, the system comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract.
a plurality of transceivers, each transceiver being in communication with at least one other of the plurality of transceivers, wherein each transceiver has a unique address, wherein the unique address identities an individual transceiver, wherein each transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with the other transceivers via preformatted messages;	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine, such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine. The machine monitor incorporates a wireless transmitter for transmitting at least status information, and the command station incorporates a wireless receiver for receiving monitor transmissions. To conserve power, the machine monitors are turned on only at preprogrammed times in accordance with the time-division communication protocol. Each machine monitor includes a receiver and the command station

	includes a transmitter to enable the command station to send commands to each machine monitor." '491 patent, Abstract. "The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1.

	"In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. '491 patent, Figure 3. "During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably, the status request transmitted by the command station 6 will include instructions for which data and which functions the monitor 41 is to perform." '491 patent, 7:28-34. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4." '491 patent, 7:56-58. "As shown in FIG. 3, a preferred embodiment incorporates a radio frequency (RF) transceiver 430 which performs data transmission as well as data reception. The transceiver 430 of this preferred embodiment further consists of a modulator/demodulator circuit 432, such as the Harris HSP 3824 spread spectrum processor, which, in the transmit mode, modulates a carrier wave (CW) signal with the baseband digital sensor data. The CW signal is fed to an RF power amplifier circuit 434, such as the Hewlett Packard HPMX3003, which

	amplifies the CW signal into an RF signal to be transmitted from the antenna 406." '491 patent, 15:6-15. "The transceiver 430 also provides for receiving and decoding messages from the command station 6 which are transmitted to the machine monitor 4 in the form of RF signals." '491 patent, 15:16-19. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet. … The identification code transmitted by the machine monitor 4 is received by the command station 6, and the command station computer 612 compares the code to values stored in a table within the command station computer 612." '491 patent, 16:50-63. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion

	when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23.
a controller, connected to one of the plurality of transceivers, the controller being in communications with each of the plurality of transceivers via a controller transceiver, the controller communicating via preformatted messages, wherein the preformatted messages comprises at least one packet, wherein the packet comprises:	"The system includes a plurality of machine monitors positioned to monitor operational characteristics of a machine. Each monitor includes a receiver for receiving wireless command signals, at least one sensor for sensing a characteristic of a machine, a data processor for receiving and processing sensor signals to produce status data, a transmitter for transmitting wireless status signals corresponding to the status of the machine…." '491 patent, 2:27-35. "In FIG. 3, a functional block diagram of the machine monitor 4 of FIG. 1 is shown. Each machine monitor 4 contains at least one sensor 408 which is integrated with the machine monitor housing in such a manner that the desired machine characteristic is accurately measured when the machine monitor housing is fastened to the machine." '491 patent, 5:13-18. "The digital sensor signals are fed to a monitor computer 418, such as the Toshiba TMP93CM41 microcomputer. …The monitor computer 418 includes a data processor 420 which performs 16-bit operations with 32-bit extended registers. The monitor computer 418 also incorporates memory 422 consisting of at least 32 kilobytes of static RAM, a timer 424, a serial interface 426, and a battery status monitor circuit 428." '491 patent, 5:46-55. '491 patent, Figure 3.
a receiver address comprising a scalable address of the at least	"FIG. 8 illustrates a typical preferred time-division

one of the intended receiving transceivers;	communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. '491 patent, 7:25-38. '491 patent, Figure 8. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20. "During the setup/configuration process, the monitor 4 receives a unique monitor 4 ID number (address), a date/time synchronization by the command station 6 (current time/date),

	and a date/time of a monitor's first status poll. At the date/time of the first status poll, the monitor 4 will turn on its transceiver and wait to receive a status poll command." '491 patent, 12:31-36. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor 4 transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet." '491 patent, 16:50-54. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-

	B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first,

	broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a

	network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing

	explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
sender address comprising the unique address of the sending transceiver;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. '491 patent, 7:25-38.

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

	"During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20.
a command indicator comprising a command code;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. '491 patent, 7:25-38. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special

	requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor 4 transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet." '491 patent, 16:50-54. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the

	'903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and

	depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2.

	U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
at least one data value comprising a scalable message; and	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. "During normal communications, the monitor 4 powers up once

	every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs'

	stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25.

	"The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the

	first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385,

	November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector comprising a redundancy check error detector;	"A preferred embodiment of the invention provides for error detection in the data that the command station receives from the machine monitor 4. In accordance with a preferred error detection scheme, the machine monitor 4 transmits a 16-bit cyclic redundancy check (CRC) message immediately after transmitting the sensor data message." '491 patent, 16:25-30.
wherein the controller sends preformatted command messages via the controller transceiver, and the plurality of transceivers send preformatted response messages; and	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41

	responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. '491 patent, Figure 8.
wherein at least one of the plurality of transceivers further sends preformatted emergency messages.	"The monitor computer 418 is programed to transmit this battery status message to the command station 6 as status data, and to transmit a battery status alert when the battery voltage falls below a programmed threshold level." '491 patent, 6:5-9. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20.

	While it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation. U.S. Patent No. 6,366,217, discloses that "[t]he information signal contains the data collected by the sensor interface module, or the emergency code." '217 patent, 13:66-14:1. U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.

18. The system of claim 17, wherein the controller maintains periods of silence by not sending the preformatted command messages during predetermined time periods; and	The above contentions for claim 17 are hereby incorporated by reference. "During the setup/configuration process, the monitor 4 receives a unique monitor 4 ID number (address), a date/time synchronization by the command station 6 (current time/date), and a date/time of a monitor's first status poll. At the date/time of the first status poll, the monitor 4 will turn on its transceiver and wait to receive a status poll command." '491 patent, 12:31-36. "A timer 818 provides the clock signals necessary for proper timing of the receive and transmit intervals for each machine monitor 4 assigned to the repeater 8." '491 patent, 18:22-25. "While it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation. U.S. Patent No. 6,366,217, discloses that "[t]he information signal contains the data collected by the sensor interface module, or the emergency code." '217 patent, 13:66-14:1. U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
wherein the at least one of the plurality of transceivers detects a period of silence and sends the preformatted emergency message during the period of silence.	"During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20. "While it is preferable to transmit a signal from the machine monitor 4 to the command station 6 only at scheduled times, it is contemplated that the machine monitor 4 could also incorporate means of continuously sensing an extreme fault condition of the

	machine being monitored, such as the use of tuned reed switches for detecting an extreme vibration condition. When such an extreme fault condition occurs, the monitor computer 418 "wakes up" from standby mode, processes the signal from its one or more sensors 408, and transmits a data packet consisting of the machine monitor's identification code and the sensor data to the command station 6. To avoid interference with regularly scheduled data messages, these fault messages are transmitted only during special tie intervals which are individually assigned to each machine monitor 4 specifically for the transmission of fault messages." '491 patent, 17:13-28. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation. U.S. Patent No. 6,366,217, discloses that "[t]he information signal contains the data collected by the sensor interface module, or the emergency code." '217 patent, 13:66-14:1. U.S. Patent No. 5,874,903 discloses that CEBus protocol "preferably also has the capacity to allow the meter to report by exception for events such as security related activities and outage reporting." '903 patent, 3:47-50.
37. A method of communicating between geographically remote devices, the method comprising:	"A wireless machine monitoring and communication system includes one or more machine monitors which attach to one or more machines to sense a physical characteristic of the machine,

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

	such as vibration or temperature, and to produce wireless transmissions corresponding to the sensed characteristic. A command station executes machine status polling in accordance with a time-division communication protocol and processes machine status data obtained during polling to determine the status of the machine." '491 Abstract
sending a message;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. '491 patent, Figure 8.
receiving the message at one or more of the remote devices;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command

	station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. '491 patent, Figure 8.
processing the message;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

	to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. '491 patent, Figure 8.
preparing a response message;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. '491 patent, Figure 8.
receiving the response message;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command

	station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. '491 patent, Figure 8.
processing the response message	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum

	to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. '491 patent, Figure 8.
wherein all messages comprise at least one packet, the packet having a predetermined format;	"To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor 4 transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet." '491 patent, 16:50-54.
wherein the predetermined format comprises:	
a receiver address comprising a scalable address of the at least one of the intended receiving remote devices;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. '491 patent, 7:25-38. '491 patent, Figure 8. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

	command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20. "During the setup/configuration process, the monitor 4 receives a unique monitor 4 ID number (address), a date/time synchronization by the command station 6 (current time/date), and a date/time of a monitor's first status poll. At the date/time of the first status poll, the monitor 4 will turn on its transceiver and wait to receive a status poll command." '491 patent, 12:31-36. "To enable the command station 6 to verify which machine monitor 4 is transmitting a data message, each machine monitor 4 transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet." '491 patent, 16:50-54. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers*

	Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields

	demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

	modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse

	poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.

a sender address comprising an unique address of the sender;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. '491 patent, 7:25-38. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." '491 patent, 13:8-20.
a command indicator comprising a command code;	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18

	shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41 responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. '491 patent, 7:25-38. "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." "To enable the command station 6 to verify which machine

	monitor 4 is transmitting a data message, each machine monitor 4 transmits a unique identification code prior to the sensor data message. The identification code combined with the sensor data message comprise a data packet." '491 patent, 16:50-54. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,963,650 ("the '650 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,963,650 discloses: "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message

	with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a scalable data value comprising a scalable message; and	"FIG. 8 illustrates a typical preferred time-division communication protocol for the system of FIG. 1 (excluding tachometers 5a-c) in accordance with the time slice schedule 18 shown in FIG. 9. During the first time slice 22, the command station 6 transmits a status request to monitor 41, and monitor 41

	responds by transmitting the requested status information to the command station 6 during time slice 24. Preferably the status request transmitted by the command station will include instructions for which data and which functions the monitor 41 is to perform. Alternatively, the desired data and functions are programmed into the monitor 41 and the status request is simply a request for the monitor to perform functions and transmit data in accordance with its programming. … The quantity of the data transmitted (i.e., vibration, temperature, spectral, or other) by the monitor 41 during status polling is preferably kept to a minimum to reduce the length of time required to complete the time slice schedule 18. '491 patent, 7:25-38. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '491 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '491 patent with the teachings of one or more of the additional references teaching this limitation, for example,

	Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets:

	U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31.

	"For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present,

	resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375,

	October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
an error detector that is a redundancy check error detector; and	"A preferred embodiment of the invention provides for error detection in the data that the command station receives from the machine monitor 4. In accordance with a preferred error detection scheme, the machine monitor 4 transmits a 16-bit cyclic redundancy check (CRC) message immediately after transmitting the sensor data message." '491 patent, 16:25-30.
wherein the steps of sending and receiving are repeated until the message is received by the intended receiver.	"The basic components of the system include: (1) one or more machine monitors 4 which are placed in various locations on, or in, one or more machines and which transmit wireless signals containing status data representative of the status of the machine and the status of the monitor, the machine status data being representative of machine characteristics such as vibration, electromagnetic energy, and temperature, the monitor status data being representative of monitor characteristics such as the condition of the monitor's battery, circuitry, and sensors; (2) a command station 6 which transmits commands and information to the machine monitors 4, receives data transmitted from the machine monitors 4, and formats the data as desired by an operator; and (3) one or more repeaters 8 as needed to facilitate communication between the machine monitors 4 and the command station 6, especially when site conditions make such aid necessary." '491 patent, 4:41-57. '491 patent, Figure 1. "The repeater 8 of FIG. 1 as shown in block diagram form in FIG. 7. The RF sensor data message from a machine monitor 4 is received by the antenna 802, converted down to IF by the down-

Exhibit P5 – Invalidity Chart for U.S. Patent No. 6,914,893 based on U.S. Patent No. 5,907,491

	converter circuit 804, and demodulated by the modulator/demodulator circuit 806 to recover the original baseband sensor data. The sensor data is then passed over the serial interface 810 of the repeater computer 812 to the data processor 814. The sensor data is the either stored in memory 816 or is passed to the modulator/demodulator circuit 806 and the RF power amplifier/down-converted circuit 804 of the repeater transceiver 808 to create a "new" RF sensor data signal. This signal is transmitted from the repeater antenna 802 to the command station 6. The repeater 8 operates in a similar fashion when relaying data from the command station 6 to the machine monitors 4." '491 patent, 18:8-23. '491 patent, Figure 7.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

The '492 Patent – Claim	U.S. Patent No. 5,963,650
1. In a communication system to communicate command and sensed data between remote devices, the system comprising:	"A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
a receiver address comprising a scalable address of at least one remote device;	"As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.

	'650 patent, Figure 3. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number,

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically

	transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and

	an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a command indicator comprising command code;	"Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. "Once a request for data is received, the processor 104 examines the secondary cache 108 to determine if the data is present. If it is, then the data is returned to the APP 112 without having to access the DA 102. This provides fast query response to the APP 112 and eliminates data traffic to the DA 102 entirely. If the requested data is not in the secondary cache 108, then the processor 104 initiates communication with a particular DA 102 via data acquisition device connector 106 (hereinafter DAC 106). '650 patent, 6:31-41. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may

	be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3. "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15. "The system provides a remotely located data acquisition device which may be a sensor or a piece of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-28. "A significant advantage of the program storage is that in combination with the uniform I/O connector interface, it allows a single interchangeable RF transceiver type to be customized to

	work with a wide variety of devices, such as weather or security sensors, agricultural devices, manufacturing equipment, etc." '650 patent, 5:37-42. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter

	memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its

	most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a data value comprising a scalable message; and	"As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3. "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.

	"The system provides a remotely located data acquisition device which may be a sensor or a piece of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-28. "A significant advantage of the program storage is that in combination with the uniform I/O connector interface, it allows a single interchangeable RF transceiver type to be customized to work with a wide variety of devices, such as weather or security sensors, agricultural devices, manufacturing equipment, etc." '650 patent, 5:37-42. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device.

	It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25.

	"The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A

	tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing:

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a controller associated with a remote device comprising a transceiver configured to send and receive wireless signals, the remote device configured to send a preformatted message comprising the receiver address, a command indicator, and the data value via the transceiver to at least one other remote device.	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	the data collection device through other data acquisition devices." '650 patent, 3:27-47. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. "Once a request for data is received, the processor 104 examines the secondary cache 108 to determine if the data is present. If it is, then the data is returned to the APP 112 without having to access the DA 102. This provides fast query response to the APP 112 and eliminates data traffic to the DA 102 entirely. If the requested data is not in the secondary cache 108, then the processor 104 initiates communication with a particular DA 102 via data acquisition device connector 106 (hereinafter DAC 106). "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2.
2. The system of claim 1, further comprising:	The above contentions for claim 1 are hereby incorporated by reference.
a plurality of transceivers each having a unique address, the transceiver being one of the plurality of transceivers;	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices,

	relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3.
a plurality of controllers associated with each the controller associated with at least one of the transceivers, the controller being in communication with at least one other transceiver with a preformatted message, the preformatted message having at least one scalable field;	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. "Once a request for data is received, the processor 104 examines the secondary cache 108 to determine if the data is present. If it is, then the data is returned to the APP 112 without having to

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	access the DA 102. This provides fast query response to the APP 112 and eliminates data traffic to the DA 102 entirely. If the requested data is not in the secondary cache 108, then the processor 104 initiates communication with a particular DA 102 via data acquisition device connector 106 (hereinafter DAC 106). '650 patent, 6:31-41. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header.

	ETE Header: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43.

	'252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing:

	Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
at least one sensor associated with at least one of the transceivers to detect a condition and output a data signal to the transceiver; and	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside

	of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. "Once a request for data is received, the processor 104 examines the secondary cache 108 to determine if the data is present. If it is, then the data is returned to the APP 112 without having to access the DA 102. This provides fast query response to the APP 112 and eliminates data traffic to the DA 102 entirely. If the requested data is not in the secondary cache 108, then the processor 104 initiates communication with a particular DA 102 via data acquisition device connector 106 (hereinafter DAC 106). "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can

	be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3.
at least one actuator associated with at least one of the transceivers to activate a device.	"Another technique used to reduce battery power consumption is to place the data acquisition device in a "sleep" mode, whereby the device normally rests in a low power state until activated by a signal demanding a data reading. When the signal is received, full power is applied to the data acquisition device, the data (e.g. meter reading) is read, the data is transmitted to the data collection system, and the data acquisition device is placed back in the sleep state until the next measurement is required." '650 patent, 1:63-2:4. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. "Once a request for data is received, the processor 104 examines the secondary cache 108 to determine if the data is present. If it is, then the data is returned to the APP 112 without having to access the DA 102. This provides fast query response to the APP 112 and eliminates data traffic to the DA 102 entirely. If the requested data is not in the secondary cache 108, then the processor 104 initiates communication with a particular DA 102 via data acquisition device connector 106 (hereinafter DAC 106).

	'650 patent, 6:31-41. "In the preferred embodiment, microcontroller 214 is a low power device which monitors RF transceiver 210 for valid radio transmissions. When a radio transmission is detected, microcontroller 214 activates microprocessor 212 so that the RF transmission can be properly processed." '650 patent, 8:1-6. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3.
3. The system of claim 1, wherein the controller sends the preformatted message via an associated transceiver, and at least one transceiver sends the preformatted response message.	The above contentions for claim 1 are hereby incorporated by reference. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. "Once a request for data is received, the processor 104 examines the secondary cache 108 to determine if the data is present. If it is, then the data is returned to the APP 112 without having to

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	access the DA 102. This provides fast query response to the APP 112 and eliminates data traffic to the DA 102 entirely. If the requested data is not in the secondary cache 108, then the processor 104 initiates communication with a particular DA 102 via data acquisition device connector 106 (hereinafter DAC 106). ‘650 patent, 6:31-41. “Those skilled in the art will recognize that minor changes can be made to the foregoing method. For example, a meter reading may be initiated by the first APP 112 to request data for a billing period. When the APP 112 request meter data, the DCS 100 sends a command to the DA 102 which in turn commands the I/O device to transfer the meter data from all of the meters to its primary cache 202.” ‘650 patent, 10:7-12.
4. The system of claim 1, wherein at least one transceiver receives the preformatted message requesting sensed data, confirms the receiver address as its own unique address, receives a sensed data signal, formats the sensed data signal into scalable byte segments, determines the number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet.	The above contentions for claim 1 are hereby incorporated by reference. “Those skilled in the art will recognize that minor changes can be made to the foregoing method. For example, a meter reading may be initiated by the first APP 112 to request data for a billing period. When the APP 112 request meter data, the DCS 100 sends a command to the DA 102 which in turn commands the I/O device to transfer the meter data from all of the meters to its primary cache 202.” ‘650 patent, 10:7-12. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the ‘650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the ‘650 patent with the teachings of one or more of the additional references teaching this limitation, for example,

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets:

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31.

	"For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present,

	resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375,

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
6. The system of claim 1, wherein each remote device is adapted to transmit and receive radio frequency transmissions to and from at least one other transceiver.	The above contentions for claim 1 are hereby incorporated by reference. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
8. A method of communicating command and sensed data between remote wireless devices, the method comprising:	"A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
providing a receiver to receive at least one message;	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	'650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3.
wherein the message has a packet comprising a command indicator comprising a command code, a scalable data value comprising a scalable message, and an error detector that is a redundancy check error detector; and	"As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3. "The foregoing examples concentrated on utility meter data

	collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15. "The system provides a remotely located data acquisition device which may be a sensor or a piece of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-28. "A significant advantage of the program storage is that in combination with the uniform I/O connector interface, it allows a single interchangeable RF transceiver type to be customized to work with a wide variety of devices, such as weather or security sensors, agricultural devices, manufacturing equipment, etc." '650 patent, 5:37-42. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more

	of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean,

	structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps"

	which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device

	and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service

	modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.

providing a controller to determine if at least one received message is a duplicate message and determining a location from which the duplicate message originated.	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2.
9. The method of claim 8, further comprising providing at least one remote wireless communication device, wherein at least one of the devices comprise geographically remote transceivers adapted to transmit and receive at least one message using radio frequency transmissions.	The above contentions for claim 8 are hereby incorporated by reference. "A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
10. The method of claim 8, further comprising providing at least one remote wireless communication device, wherein at least one of the devices has a unique address and the packet further comprises at least one scalable address field to contain the unique address for at least one device.	The above contentions for claim 8 are hereby incorporated by reference. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine

	and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43.

	'252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is

	identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
11. The method of claim 8, further comprising providing an actuator associated with at least one of the remote devices, the actuator configured to actuate in response to the command code.	"Another technique used to reduce battery power consumption is to place the data acquisition device in a "sleep" mode, whereby the device normally rests in a low power state until activated by a signal demanding a data reading. When the signal is received, full power is applied to the data acquisition device, the data (e.g. meter reading) is read, the data is transmitted to the data collection system, and the data acquisition device is placed back in the sleep state until the next measurement is required." '650 patent, 1:63-2:4. "In the preferred embodiment, microcontroller 214 is a low power device which monitors RF transceiver 210 for valid radio transmissions. When a radio transmission is detected, microcontroller 214 activates microprocessor 212 so that the RF transmission can be properly processed." '650 patent, 8:1-6. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
13. The method of claim 8, further comprising determining if an	The above contention for claim 8 is hereby incorporated by

error exists in a packet of the at least one message.	reference. "A unique feature of the preferred embodiment is its use of pincodes to encrypt the CRC data. In the preferred embodiment, the networks 402, 406 use pincodes 404, 408 to encrypt the cyclic redundancy check (CRC) data. CRC data is well known in the art." '650, 9:9-14.use pincodes 404, 408 to encrypt the cyclic redundancy check.
14. A wireless communication device for use in a communication system to communicate command and sensed data between remote wireless communication devices, the wireless communication device comprising:	"A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.

a transceiver configured to send and receive wireless communications; and	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device

	206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, Jubin, and other references as cited below. For example, Jubin, which is also directed to the PRNET, teaches: *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header.

	ETE Header: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43.

	'252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition

	to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing:

	Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to format a message comprising a receiver address comprising a scalable address of at least one remote wireless device; a command indicator comprising a command code, a data value comprising a scalable message.	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside

	of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	"In the preferred embodiment, a complete wireless networking protocol is stored in DA 102 which is capable of supporting both point to point and point to multipoint communications. In addition, source routing of messages in included in the stored program to allow the transmission distance of DA 102 to be extended by routing messages across multiple DAs 102. " '650 patent, 7:29-35. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET,

	discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the

	command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters

	and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43.

	'252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition

	to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing:

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
15. The wireless communication device of claim 14, further comprising at least one sensor configured to detect a condition and output a signal to the controller.	The above contentions for claim 14 are hereby incorporated by reference. "The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The

	detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2.
16. The wireless communication device of claim 14, wherein the controller is further configured to determine if at least one received message is a duplicate message and determine a location from which the duplicate message originated.	The above contentions for claim 14 are hereby incorporated by reference. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3.
17. The wireless communication device of claim 14, further comprising at least one actuator configured to implement an action corresponding to the command code.	The above contention for claim 14 is hereby incorporated by reference.

	"Another technique used to reduce battery power consumption is to place the data acquisition device in a "sleep" mode, whereby the device normally rests in a low power state until activated by a signal demanding a data reading. When the signal is received, full power is applied to the data acquisition device, the data (e.g. meter reading) is read, the data is transmitted to the data collection system, and the data acquisition device is placed back in the sleep state until the next measurement is required." '650 patent, 1:63-2:4. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. "Once a request for data is received, the processor 104 examines the secondary cache 108 to determine if the data is present. If it is, then the data is returned to the APP 112 without having to access the DA 102. This provides fast query response to the APP 112 and eliminates data traffic to the DA 102 entirely. If the requested data is not in the secondary cache 108, then the processor 104 initiates communication with a particular DA 102 via data acquisition device connector 106 (hereinafter DAC 106). In the preferred embodiment, RF links 114 are used to transfer data between DAs 102 and DACs 106." '650 patent, 6:31-41. "In the preferred embodiment, microcontroller 214 is a low power device which monitors RF transceiver 210 for valid radio transmissions. When a radio transmission is detected,

	microcontroller 214 activates microprocessor 212 so that the RF transmission can be properly processed." '650 patent, 8:1-6. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3.
18. The device of claim 14, wherein the transceiver comprises a unique transceiver address to distinguish the transceiver from other transceivers.	The above contentions for claim 14 are hereby incorporated by reference. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. "Once a request for data is received, the processor 104 examines the secondary cache 108 to determine if the data is present. If it is, then the data is returned to the APP 112 without having to access the DA 102. This provides fast query response to the APP 112 and eliminates data traffic to the DA 102 entirely. If the requested data is not in the secondary cache 108, then the processor 104 initiates communication with a particular DA 102 via data acquisition device connector 106 (hereinafter DAC 106).

	'650 patent, 6:31-41. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3.
19. In a system for communicating commands and sensed data between remote devices comprising a communications device for communicating commands and sensed data, the communications device comprising:	"A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
a transceiver operably configured to be in communication with at least one other of a plurality of transceivers, wherein the transceiver has a unique address, wherein the unique address identities the individual transceiver, wherein the transceiver is geographically remote from the other of the plurality of transceivers, wherein each transceiver communicates with each of the other transceivers via preformatted messages;	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214,

	and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "In the preferred embodiment, a complete wireless networking protocol is stored in DA 102 which is capable of supporting both point to point and point to multipoint communications. In addition, source routing of messages in included in the stored program to allow the transmission distance of DA 102 to be extended by routing messages across multiple DAs 102. " '650 patent, 7:29-35. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3.
a controller configured to be in communication with the transceiver, the controller configured to provide preformatted	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

messages for communication;	The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2.
wherein the preformatted message comprises at least one packet, wherein the packet comprises: a receiver address comprising a scalable address of the at least one of the intended receiving transceivers; sender address comprising the unique address of the sending transceiver; a command indicator comprising a command code; at least one data value comprising a scalable message; and an error detector comprising a redundancy check error detector; and wherein the controller is configured to interact with the transceiver to send preformatted command messages.	"Another technique used to reduce battery power consumption is to place the data acquisition device in a "sleep" mode, whereby the device normally rests in a low power state until activated by a signal demanding a data reading. When the signal is received, full power is applied to the data acquisition device, the data (e.g. meter reading) is read, the data is transmitted to the data collection system, and the data acquisition device is placed back in the sleep state until the next measurement is required." '650 patent, 1:63-2:4. "The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The

	data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station,

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "In the preferred embodiment, a complete wireless networking protocol is stored in DA 102 which is capable of supporting both point to point and point to multipoint communications. In addition, source routing of messages in included in the stored program to allow the transmission distance of DA 102 to be extended by routing messages across multiple DAs 102. " '650 patent, 7:29-35. "In the preferred embodiment, microcontroller 214 is a low power device which monitors RF transceiver 210 for valid radio transmissions. When a radio transmission is detected, microcontroller 214 activates microprocessor 212 so that the RF transmission can be properly processed." '650 patent, 8:1-6. "A unique feature of the preferred embodiment is its use of pincodes to encrypt the CRC data. In the preferred embodiment, the networks 402, 406 use pincodes 404, 408 to encrypt the cyclic redundancy check (CRC) data. CRC data is well known in the art." '650, 9:9-14. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can

	be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26.

	Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data,

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used

	for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery

	subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
20. The communication device of claim 19, further comprising a sensor operatively configured to detect a condition and output a sensed data signal that corresponds to the condition to the transceiver.	The above contentions for claim 19 are hereby incorporated by reference. "The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4.

	'650 patent, Figure 2.
21. The communication device of claim 20, wherein the transceiver is configured to receive a preformatted command message requesting sensed data, confirms the receiver address is its own unique address, receives the sensed data signal, formats the sensed data signal into scalable byte segments, determines a number of segments required to contain the sensed data signal, and generates and transmits the preformatted response message comprising at least one packet.	The above contentions for claim 20 are hereby incorporated by reference. "The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.

	‘650 patent, Figure 3. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the ‘650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the ‘650 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 (“the ‘217 patent”), U.S. Patent No. 5,907,491 (“the ‘491 patent”), U.S. Patent No. 7,027,773 (“the ‘773 patent”), U.S. Patent No. 6,100,817 (“the ‘817 patent”), U.S. Patent No. 5,874,903 (“the ‘903 patent”) or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: “From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated.” Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: “PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator.” Jubin page 23. “A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute

	jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. *"A.Packet Headers* Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses:

	"The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent

	week of measurement activity." U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.

	In addition, the following references disclose the use of scalable fields in radio packets: U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31. "For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing

	performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present, resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375, October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.
25. A wireless communication device for use in a communication system to communicate a number of commands and sensed data between remote wireless communication devices, the wireless communication device comprising:	"A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
a transceiver configured to send and receive wireless	"The present invention solves the foregoing problems by

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

communications; and	providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely

	attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3.
a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to reformat a message comprising receiver address comprising a scalable address of at least one remote wireless device; a command indicator comprising a command code; a data value comprising a scalable message.	"Another technique used to reduce battery power consumption is to place the data acquisition device in a "sleep" mode, whereby the device normally rests in a low power state until activated by a signal demanding a data reading. When the signal is received, full power is applied to the data acquisition device, the data (e.g. meter reading) is read, the data is transmitted to the data collection system, and the data acquisition device is placed back in the sleep state until the next measurement is required." '650 patent, 1:63-2:4. "The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer-to-peer operation. For example, a user application can issue a command or query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices." '650 patent, 5:46-51. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13.

	"In the preferred embodiment, a complete wireless networking protocol is stored in DA 102 which is capable of supporting both point to point and point to multipoint communications. In addition, source routing of messages in included in the stored program to allow the transmission distance of DA 102 to be extended by routing messages across multiple DAs 102. " '650 patent, 7:29-35. "In the preferred embodiment, microcontroller 214 is a low power device which monitors RF transceiver 210 for valid radio transmissions. When a radio transmission is detected, microcontroller 214 activates microprocessor 212 so that the RF transmission can be properly processed." '650 patent, 8:1-6. "A unique feature of the preferred embodiment is its use of pincodes to encrypt the CRC data. In the preferred embodiment, the networks 402, 406 use pincodes 404, 408 to encrypt the cyclic redundancy check (CRC) data. CRC data is well known in the art." '650, 9:9-14. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. '650 patent, Figure 3.

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23. "A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23.

	"A.Packet Headers Every packet transmitted by every PR contains several headers, which add about 10 percent to the packet length. Each header corresponds to a protocol layer. Strict layering produces a clean, structured design, but also causes the headers to be longer than they could be because of duplication of some fields and fragmentation of other among the headers. The packet headers that are of concern to this paper are the end-to-end (ETE) header and the routing header. *ETE Header*: The ETE header is created by the source device. It contains the source device ID, which is use to update the PRs' stored device-PR correspondence data (Section III-C), and the destination device ID, which is used in forwarding (Section IV-B). … *Routing Header:* The routing header is created by the source PR, encapsulating the ETE header." Jubin page 25 (see Table for routing header fields). "The routing header stays on the packet throughout its forwarding through the PRNET subnet. The source PR ID, sequence number, and destination PR ID created by the source PR stay fixed throughout the packet's journey to the destination PR. The rest of the fields are updated by every intermediate packet radio." Jubin page 25-26. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247.

	"A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 7,027,773 discloses:

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	"The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31. In addition, the following references disclose the use of scalable fields in radio packets:

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	U.S. Patent No. 5,673,252 to Johnson: "FIG. 25 depicts the structure of a well-known standard data link packet, the HDLC frame format. Using this structure, flag fields demark the start and end of the packet, and implicitly define the length of the variable length information field. The source or destination address is specified in an expanding, in byte units, address field. An 8-bit, or 16-bit, if larger sequence numbers are desired, control field identifies the type of the packet, e.g., information, supervisory or unnumbered, and contains send and receive sequence numbers." '252 patent, 38:34-43. '252 patent, Figure 25. "The wide area communications network data ink layer uses three delivery mechanisms for messages on the RND link. The first, broadcast to class address, is used for messages which are supposed to be received by all network service modules belonging to a particular class, usually based on network service module type. FIG. 31 illustrates an RND broadcast to class address data link packet structure. The second, broadcast to individual address, is used for messages intended for one individual network service module; the message is periodically transmitted and the network service module is expected to eventually hear the message. The third, reverse poll, is also used for messages intended for one individual network service module, but a message is not transmitted until the network service module sends a message explicitly requesting the reverse poll." '252 patent, 39:28-43. '252 patent, Figure 31.

	"For network service modules, broadcast addressing arises in several different circumstances, and is handled differently for each. Some information is intended for all network service modules, and is identified only by the slot/subchannel the information occupies; no address is specified. Some information is intended for only one network service module, and network service module type and address are required; alternatively, type ay be omitted if implied by subchannel. Finally, some information is intended only for a subset, or tier, of the network service modules of a particular type. In this case, all network service modules will recognize a tiered address have, in addition to their normal ID, a 24-bit tier address assigned to them. A tiered address, on a transmitted packet, includes two parts, the first is a 24-bit pattern and the second is a 24-bit mask selecting which of the pattern bits must match corresponding bits of a network service module's assigned tier address for that network service module to be addressed." '252, 42:18-39. "FIG. 42 illustrates an RND broadcast to class network message format in the context of a data link packet. A complete message includes: optional address (nsmtyp-Data Link packet field), message (cofftend) type, application specific control subfield and an application message. The address may only be omitted, and "network message" field enlarged by 8 bits, if the delivery subchannel is dedicated to a single network service module type. Each application is responsible for any message sequencing performed. … Delivery to individually addressed network service modules is identical in principle to the broadcast to class address except the nmsadr portion of the data link address field must be present,

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,697,492 based on U.S. Patent No. 5,963,650

	resulting in a "network message" field which is 32 bits smaller. This message structure is used both for broadcast to individual address and for reverse poll delivery mechanisms. FIG. 43 illustrates an RND broadcast to individual address and reverse poll network message format in the context of a data link packet." '252 patent, 55:40-59. '252 patent, Figures 42 and 43. In addition, a number of Network Working Group, Request for Comment publications discuss the use of scalable fields in IP addressing: Network Working Group Request for Comments No. 1385, November 1992, Z. Wang, disclosing "The Internet faces two serious scaling problems: address exhaustion and routing explosion." Wang discloses and Extended Internet Protocol that uses an EIP extension of variable length that holds the Source Network field and Destination Network field as an extension to addressing space. Network Working Group Request for Comments No. 986, June 1986, R. Callon & H. Braun, disclosing variable size address fields. Network Working Group Request for Comments No. 1365, September 1992, K. Siyan, disclosing "shortage of network numbers that can be assigned" for IP addressing and proposal for extending addressing fields. Network Working Group Request for Comments No. 1375,

	October 1992, P. Robinson, recognizing need for additional Internet address space as the Internet becomes more commercialized and proposing extensions for IP addressing.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

The '661 Patent – Claim	U.S. Patent No. 5,963,650
1. A system for remote data collection, assembly, storage, and event detection and reporting, comprising:	"A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"In systems which cover wide geographical or nationwide areas, many data collection systems may be linked together in a hierarchical or distributed server network, thereby allowing applications located on other computers or networks to access the data from a particular data acquisition device. By caching the data at the data collection system, substantial improvements in the overall system performance can be achieved. When global networks, such as the Internet, are used to access data acquisition devices worldwide, the use of the dual cache system described above becomes even more advantageous." '650 patent, 5:12-22.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. '650 patent, Figure 1. "FIG. 3 illustrates another technique used by the DA 102 to reduce power consumption. This technique uses peer to peer data transfers to minimize the power required by the RF transceiver 210 by reducing the transmission distance required to contact the DCS 100. As shown in this figure, a remotely located DAs 102 (Numbers 1, 2 and 3) transfer data to DA 102 (number 4), which in turn transfers the data to DA 102 (number 5) which then transfers the data to DCS 100. This configuration allows a DCS 100 to receive data from a DA 102 which may be too remotely located to contact it at a low power setting. Those skilled in the art will recognize that the configuration of DAs 102 shown in this figure can be rearranged such that a variety of redundant data paths exist for transfer of data from any particular DA 102 to the DCS 100." '650 patent, 8:45-59.
a plurality of transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN.	"Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57.
5. A system for monitoring remote devices, comprising:	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2.
at least one sensor adapted to generate an electrical signal in response to a physical condition;	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

	"The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
at least one wireless transmitter electrically interfaced with the sensor and configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a radio-frequency (RF) signal;	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data

	acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
one or more additional wireless transmitters each electrically interfaced with a sensor and configured	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the

to receive the RF signal and retransmit the RF signal;	preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. '650 patent, Figure 1.
at least one gateway connected a wide area network (WAN) configured to receive and translate the retransmitted RF signal, the gateway further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN; and	"In systems which cover wide geographical or nationwide areas, many data collection systems may be linked together in a hierarchical or distributed server network, thereby allowing applications located on other computers or networks to access the data from a particular data acquisition device. By caching the data at the data collection system, substantial improvement in the overall system performance can be achieved. When global networks, such as the Internet, are used to access data acquisition devices worldwide, the use of the dual cache system described above becomes even more advantageous." '650 patent, 5:12-23.
a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2.

	"FIG. 3 illustrates another technique used by the DA 102 to reduce power consumption. This technique uses peer to peer data transfers to minimize the power required by the RF transceiver 210 by reducing the transmission distance required to contact the DCS 100. As shown in this figure, a remotely located DAs 102 (Numbers 1, 2 and 3) transfer data to DA 102 (number 4), which in turn transfers the data to DA 102 (number 5) which then transfers the data to DCS 100. This configuration allows a DCS 100 to receive data from a DA 102 which may be too remotely located to contact it at a low power setting. Those skilled in the art will recognize that the configuration of DAs 102 shown in this figure can be rearranged such that a variety of redundant data paths exist for transfer of data from any particular DA 102 to the DCS 100." '650 patent, 8:45-59.
6. The system of claim 5, wherein the at least one gateway is permanently connected to the WAN.	The above contentions for claim 5 are hereby incorporated by reference. "In systems which cover wide geographical or nationwide areas, many data collection systems may be linked together in a hierarchical or distributed server network, thereby allowing applications located on other computers or networks to access the data from a particular data acquisition device. By caching the data at the data collection system, substantial improvement in the overall system performance can be achieved. When global networks, such as the Internet, are used to access data acquisition devices worldwide, the use of the dual cache system described above becomes even more advantageous." '650 patent, 5:12-23.
8. The system of claim 5, wherein the gateway translates the encoded electrical signal, the transmitter identification and the transceiver identification information into TCP/IP for communication over the WAN.	The above contentions for claim 5 are hereby incorporated by reference. "In systems which cover wide geographical or nationwide areas, many data collection systems may be linked together in a hierarchical or distributed server network, thereby allowing applications located on other computers or networks to access the data from a particular data acquisition device. By caching the

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

	data at the data collection system, substantial improvement in the overall system performance can be achieved. When global networks, such as the Internet, are used to access data acquisition devices worldwide, the use of the dual cache system described above becomes even more advantageous." '650 patent, 5:12-23.
9. A system for controlling a remote device comprising:	"A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCS with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
a target remote device having an actuator to be controlled;	"The system provides a remotely located data acquisition device which may be a sensor or a piece of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-28.

	"A significant advantage of the program storage is that in combination with the uniform I/O connector interface, it allows a single interchangeable RF transceiver type to be customized to work with a wide variety of devices, such as weather or security sensors, agricultural devices, manufacturing equipment, etc." '650 patent, 5:37-42. "User applications may be any activity suitable for a system which requires data from a wide area to be transmitted to a central control point. For example, in a vineyard operation, each DA 112 could be a sensor device such as a weather station or ground water monitor, a unit of active equipment such as fertilizing or irrigation equipment, etc., or a combination of any of these devices. Each APP 112 can be used for a specific purpose such as water monitoring, fertilizing, etc." '650 patent, 6:2-10. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

	Similarly, Jubin, which is also directed to the PRNET, discloses: “PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator.” Jubin page 23. “A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging.” Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: “The “function fields” provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process.” Burchfiel page 247. “A level-3 debugging protocol has been defined which supports debugging of remote PRU’s from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting “mousetraps” which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure.” Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: “Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling.” ‘491 patent, 7:56-60. “During normal communications, the monitor 4 powers up once every 60

	seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

	source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
a computer configured to execute at least one computer program that generates at least one control signal responsive to a system input signal; said computer integrated with a wide area network (WAN);	"In systems which cover wide geographical or nationwide areas, many data collection systems may be linked together in a hierarchical or distributed server network, thereby allowing applications located on other computers or networks to access the data from a particular data acquisition device. By caching the data at the data collection system, substantial improvements in the overall system performance can be achieved. When global networks, such as the Internet, are used to access data acquisition devices worldwide, the use of the dual cache system described above becomes even more advantageous." '650 patent, 5:12-22. "Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. '650 patent, Figure 1. "FIG. 3 illustrates another technique used by the DA 102 to reduce power consumption. This technique uses peer to peer data transfers to minimize the power required by the RF transceiver 210 by reducing the transmission distance

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

	required to contact the DCS 100. As shown in this figure, a remotely located DAs 102 (Numbers 1, 2 and 3) transfer data to DA 102 (number 4), which in turn transfers the data to DA 102 (number 5) which then transfers the data to DCS 100. This configuration allows a DCS 100 to receive data from a DA 102 which may be too remotely located to contact it at a low power setting. Those skilled in the art will recognize that the configuration of DAs 102 shown in this figure can be rearranged such that a variety of redundant data paths exist for transfer of data from any particular DA 102 to the DCS 100." '650 patent, 8:45-59.
a gateway connected to the WAN configured to receive and translate the at least one control signal	"Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57.
a wireless transmitter coupled with the gateway for transmitting a wireless signal that contains the control signal;	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. '650 patent, Figure 1.
a first wireless transceiver electrically interfaced with an actuator for receiving the wireless signal and further retransmitting the wireless signal to the target remote device; and	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

	capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.

logic coupled to the target remote device for extracting the control signal from the retransmitted wireless signal and imparting an action on the actuator in response to the extracted control signal.	"FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, Kahn, Jubin, Burchfiel, U.S. Patent No. 6,366,217 ("the '217 patent"), U.S. Patent No. 5,907,491 ("the '491 patent"), U.S. Patent No. 7,027,773 ("the '773 patent"), U.S. Patent No. 6,100,817 ("the '817 patent"), U.S. Patent No. 5,874,903 ("the '903 patent") or other references as cited below. For example, Kahn, which is also directed to the PRNET, discloses: "From the station, parameters in each PR and terminal device in the network can be set remotely, selected elements can be halted, if appropriate, the collection of statistical data from selected devices may be enabled, traffic sources may be turned on or off, and data collection may be initiated." Kahn, page 1495. Similarly, Jubin, which is also directed to the PRNET, discloses: "PRs can also be loaded and debugged from a remote host computer. All the commands available to a local operator are available to a remote operator." Jubin page 23.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

	"A plethora of terminal commands – display memory, alter memory, select/display trace breakpoint, display state, execute jobs, execute procedure, etc.—are available for local debugging." Jubin page 23. Also, Burchfiel, which is also directed to the PRNET, discloses: "The "function fields" provides an address: within a PRU, it selects the control process, the debugging process, or the measurement process." Burchfiel page 247. "A level-3 debugging protocol has been defined which supports debugging of remote PRU's from terminals attached to a central station. The debugging functions include examining and depositing words into the PRU memory, and setting "mousetraps" which send an error code to the controlling station when some anomalous condition occurs, e.g., hardware failure." Burchfiel page 248. U.S. Patent No. 5,907,491 discloses: "Special requests for data sensing, data analysis, data transmission, and data storage can also be transmitted by the command station 6 to one or more monitors 4. Such special requests are additional to the data and functions provided by monitors 4 during normal status polling." '491 patent, 7:56-60. "During normal communications, the monitor 4 powers up once every 60 seconds. As data is acquired by the monitors 4, it is preferably stored in memory 422 for a period of time. When the monitor transmits an alarm message to the command station 6, the command station 6 may then command the monitor to transmit its most recently stored data. For example, the monitor 4 can be programmed (either at the factory before being shipped, by the ICU 9 during installation or reconfiguration, or through appropriate wireless commands transmitted by the command station 6 before, during, or after

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

	installation) to store spectral data for each vibration measurement obtained during the most recent week of measurement activity." U.S. Patent No. 7,027,773 discloses: "The Data portion of a MinionNet network Standard Message with a Type Code meaning "Command" will contain information originating with the MinionNet network Control Center that causes certain operations to be performed by the Minion device and results to be sent back to the Control Center. This can be used to set operating modes or data throughout the MinionNet network." '773 patent; 22:13-19. U.S. Patent No. 6,100,817 discloses: "In the preferred embodiments of the invention, the CEBUS message packets provide fields for addressing individual meters and groups of meters, for performing multi level repeater functions, authentication/password control." '817 patent, 2:65-3:2. U.S. Patent No. 5,874,903 discloses: "Meter information in a node protocol packet includes meter ID, a repeat count, data and destination address, and error detection bits. The data/destination bits of the meter protocol are passed through to the CEBus network and include source and destination addresses, data, and error detection bits. In presently preferred embodiments of the invention, the pass through protocols for the system are table based. The tables are designed to allow data, functions, commands, schedules, etc., to be passed to the different system elements." '903, 4:23-31.
10. The system of claim 9, further comprising:	The above contentions for claim 9 are hereby incorporated by reference.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

a plurality of additional wireless transceivers each coupled to an actuator and configured to receive the wireless signal and to retransmit the wireless signal, wherein one of the plurality of additional wireless transceivers receive the wireless signal from the wireless transmitter and another one of the plurality of the additional wireless transceivers retransmits the wireless signal to the first wireless transceiver.	"As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
11. The system of claim 9, further comprising:	The above contentions for claim 9 are hereby incorporated by reference.
a plurality of additional wireless transceivers each coupled to an actuator or a sensor and configured to receive the wireless signal and to retransmit the wireless signal, wherein one of the plurality of additional wireless transceivers receive the wireless signal from the wireless transmitter and another one of the plurality of the additional wireless transceivers retransmits the wireless signal to the first wireless transceiver.	"As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
12. A system for remote data collection, assembly, storage, and event detection and reporting, comprising:	"A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may

	require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"In systems which cover wide geographical or nationwide areas, many data collection systems may be linked together in a hierarchical or distributed server network, thereby allowing applications located on other computers or networks to access the data from a particular data acquisition device. By caching the data at the data collection system, substantial improvements in the overall system performance can be achieved. When global networks, such as the Internet, are used to access data acquisition devices worldwide, the use of the dual cache system described above becomes even more advantageous." '650 patent, 5:12-22. "Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. '650 patent, Figure 1.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

	"FIG. 3 illustrates another technique used by the DA 102 to reduce power consumption. This technique uses peer to peer data transfers to minimize the power required by the RF transceiver 210 by reducing the transmission distance required to contact the DCS 100. As shown in this figure, a remotely located DAs 102 (Numbers 1, 2 and 3) transfer data to DA 102 (number 4), which in turn transfers the data to DA 102 (number 5) which then transfers the data to DCS 100. This configuration allows a DCS 100 to receive data from a DA 102 which may be too remotely located to contact it at a low power setting. Those skilled in the art will recognize that the configuration of DAs 102 shown in this figure can be rearranged such that a variety of redundant data paths exist for transfer of data from any particular DA 102 to the DCS 100." '650 patent, 8:45-59.
a plurality of non-earth orbiting transceivers dispersed geographically at defined locations, each transceiver electrically interfaced with a sensor and configured to receive select information and identification information transmitted from another nearby wireless transceiver electrically interfaced with a sensor in a predetermined signal type and further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102

Exhibit P6 – Invalidity Chart for U.S. Patent No. 7,468,661 based on U.S. Patent No. 5,963,650

	includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
at least one gateway connected to the wide area network configured to receive and translate the select information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with one or more retransmitting transceivers, said gateway further configured to further transmit the translated information to the computer over the WAN.	"Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57.
14. The system as defined claim 12, wherein the gateway translates the encoded electrical signal, the transmitter identification, and the transceiver identification information into TCP/IP for	The above contentions for claim 12 are hereby incorporated by reference. "In systems which cover wide geographical or nationwide areas, many data collection systems may be linked together in a hierarchical or distributed server

communication over the WAN.	network, thereby allowing applications located on other computers or networks to access the data from a particular data acquisition device. By caching the data at the data collection system, substantial improvement in the overall system performance can be achieved. When global networks, such as the Internet, are used to access data acquisition devices worldwide, the use of the dual cache system described above becomes even more advantageous." '650 patent, 5:12-23.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

The '692 Patent – Claim	U.S. Patent No. 5,963,650
1. A system for remote data collection, assembly, and storage comprising:	"A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
a computer configured to execute at least one computer program that formats and stores select information for retrieval upon demand from a remotely located device, said computer integrated with a wide area network (WAN);	"In systems which cover wide geographical or nationwide areas, many data collection systems may be linked together in a hierarchical or distributed server network, thereby allowing applications located on other computers or networks to access the data from a particular data acquisition device. By caching the data at the data collection system, substantial improvements in the overall system performance can be achieved. When global networks, such as the Internet, are used to access data acquisition devices worldwide, the use of the dual cache system described above becomes even more advantageous." '650 patent, 5:12-22.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. '650 patent, Figure 1. "Another feature shown by the foregoing figures is the shared hierarchical structure of the system. In particular, the DAs 102 may be shared by multiple APPs 112. … Likewise, APPs 112 may reside on a single DCS, or be distributed over a hierarchical network of computers." '650 patent, 8:33-44. "FIG. 3 illustrates another technique used by the DA 102 to reduce power consumption. This technique uses peer to peer data transfers to minimize the power required by the RF transceiver 210 by reducing the transmission distance required to contact the DCS 100. As shown in this figure, a remotely located DAs 102 (Numbers 1, 2 and 3) transfer data to DA 102 (number 4), which in turn transfers the data to DA 102 (number 5) which then transfers the data to DCS 100. This configuration allows a DCS 100 to receive data from a DA 102 which may be too remotely located to contact it at a low power setting. Those skilled in the art will recognize that the configuration of DAs 102 shown in this figure can be rearranged such that a variety of redundant data paths exist for transfer of data from any particular DA 102 to the DCS 100." '650 patent, 8:45-59.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	'650 patent, Figure 3.
at least one wireless transmitter configured to transmit select information and transmitter identification information;	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	"As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
a plurality of relatively low-power radio-frequency (RF) transceivers dispersed geographically at defined locations configured to receive select information transmitted from at least one nearby wireless transmitter and further configured to transmit the select information, the transmitter identification information and transceiver identification information; and	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular

	function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
at least one gateway connected to the wide area network configured to receive and translate the select information, the transmitter identification information, and transceiver identification information, said gateway further configured to farther transmit the translated information to the computer over the WAN.	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. '650 patent, Figure 1. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

3. The system as defined in claim 1, wherein each wireless transmitter is configured to transmit a relatively low-power, radio-frequency (RF) signal.	The above contentions for claim 1 are hereby incorporated by reference. "The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
4. The system as defined in claim 1, wherein each wireless transmitter is integrated with a sensor.	The above contentions for claim 1 are hereby incorporated by reference. "The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

5. The system as defined in claim 1, wherein the RF signal transmitted by the receiver contains a concatenation of information comprising select information and transmitter identification information from the originating transmitter and transceiver identification information for each transceiver that receives and repeats the RF signal.	The above contentions for claim 1 are hereby incorporated by reference. "Primary cache 202 is used to store data and/or commands to or from the I/O device 206. By using the primary cache 202, a query from DCS 100 can be satisfied without activating I/O device 206 so long as the required data is in the cache 202. …In the preferred embodiment, a complete wireless networking protocol is stored in DA 102 which is capable of supporting both point to point and point to multi-point communications. In addition source routing of messages is included in the stored program to allow the transmission distance of DA 102 to be extended by routing messages across multiple DAs 102." '650. 7:28-35. "The system provides a remotely located data acquisition device which may be a sensor or a piece of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-28. "A significant advantage of the program storage is that in combination with the uniform I/O connector interface, it allows a single interchangeable RF transceiver type to be customized to work with a wide variety of devices, such as weather or security sensors, agricultural devices, manufacturing equipment, etc." '650 patent, 5:37-42. "User applications may be any activity suitable for a system which requires data from a wide area to be transmitted to a central control point. For example, in a vineyard operation, each DA 112 could be a sensor device such as a weather station or ground water monitor, a unit of active equipment such as fertilizing or irrigation equipment, etc., or a combination of any of these devices. Each APP 112 can be used for a specific purpose such as water monitoring, fertilizing, etc." '650 patent, 6:2-10.

	"In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Ensuring that the appropriate DA 102 communicates with the appropriate APP 112 is accomplished via any suitable identification protocol for communication devices." '650 patent, 6:60-63. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
6. The system as defined in claim 5, wherein the at least one transmitter is replaced by a transceiver, the transceiver further integrated with an actuator.	The above contentions for claim 5 are hereby incorporated by reference. "The system provides a remotely located data acquisition device which may be a sensor or a piece of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-28. "A significant advantage of the program storage is that in combination with the uniform I/O connector interface, it allows a single interchangeable RF transceiver type to be customized to work with a wide variety of devices, such as weather or security sensors, agricultural devices, manufacturing equipment, etc." '650 patent, 5:37-42. "User applications may be any activity suitable for a system which requires data from a wide area to be transmitted to a central control point. For example, in a vineyard operation, each DA 112 could be a sensor device such as a weather station or ground water monitor, a unit of active equipment such as fertilizing or irrigation equipment, etc., or a combination of any of these devices. Each APP 112 can be used for a specific purpose such as water monitoring, fertilizing, etc." '650 patent, 6:2-10. "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. '650 patent, Figure 1.
7. The system as defined in claim 6, wherein the transceivers are configured to communicate with the gateway via a RF signal.	The above contentions for claim 6 are hereby incorporated by reference. "The system provides a remotely located data acquisition device which may be a sensor or a piece of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-28. "A significant advantage of the program storage is that in combination with the uniform I/O connector interface, it allows a single interchangeable RF transceiver type to be customized to work with a wide variety of devices, such as weather or security sensors, agricultural devices, manufacturing equipment, etc." '650 patent, 5:37-42. "User applications may be any activity suitable for a system which requires data from a wide area to be transmitted to a central control point. For example, in a vineyard operation, each DA 112 could be a sensor device such as a weather station or ground water monitor, a unit of active equipment such as fertilizing or irrigation equipment, etc., or a combination of any of these devices. Each APP 112 can be used for a specific purpose such as water monitoring, fertilizing, etc." '650 patent, 6:2-10.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	"In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. '650 patent, Figure 1.
8. The system as defined in claim 7, wherein the computer is further configured to respond to received select information by communicating a control signal to at least one transceiver, wherein the actuator integrated with the transceiver is responsive to the control signal.	The above contentions for claim 7 are hereby incorporated by reference. "The system provides a remotely located data acquisition device which may be a sensor or a piece of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-28. "In addition, the RF transceiver includes a modifiable program storage. The program storage allows software to be downloaded to the RF transceiver for a variety of purposes. The software can be designed to perform specific activities with the I/O device, it can be used to perform diagnostics and maintenance functions, or to provide updated functions or software release levels. A significant advantage of the program storage is that in combination with the uniform I/O connector interface, it allows a single interchangeable RF

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	transceiver type to be customized to work with a wide variety of devices, such as weather or security sensors, agricultural devices, manufacturing equipment, etc." '650 patent, 5:31-42. "User applications may be any activity suitable for a system which requires data from a wide area to be transmitted to a central control point. For example, in a vineyard operation, each DA 112 could be a sensor device such as a weather station or ground water monitor, a unit of active equipment such as fertilizing or irrigation equipment, etc., or a combination of any of these devices. Each APP 112 can be used for a specific purpose such as water monitoring, fertilizing, etc." '650 patent, 6:2-10. "Primary cache 202 is used to store data and/or commands to or from the I/O device 206." '650 patent, 7:17-18. "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. '650 patent, Figure 1. "The DA 102 can be programmed to periodically (e.g., once a month) read the

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	meters by issuing commands to the I/O device. The I/O device 206 can continuously read the meters or be powered down to conserve energy. In the preferred embodiment, the I/O device is kept in a low power state and activated under control of the DA 102. When I/O device is activated, it reads all of the meters 502, 504, 506 and transfers the measured data to DA 102." ''650 patent, 9:37-45. "Those skilled in the art will recognize that minor changes can be made to the foregoing method. For example, a meter reading may be initiated by the first APP 112 to request data for a billing period. When the APP 112 requests meter data, the DCS 100 sends a command to the DA 102 which in turn commands the I/O device to transfer meter data from all of the meters to its primary cache 202." '650 patent, 10:6-12.
11. The system as defined in claim 1, wherein the gateway includes one selected from the group consisting of:	The above contentions for claim 1 are hereby incorporated by reference.
a modem for establishing a dial-up connection with a remote computer; a network card for communicating across a local area network; a network card for communicating across the WAN, a DSL modem; and an ISDN card to permit backup access to the computer.	"Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57.
12. The system as defined in claim 1, wherein the gateway translates the select information, the transmitter identification, and the transceiver identification information to TCP/IP for communication over the WAN.	The above contentions for claim 1 are hereby incorporated by reference. "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP

	112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol

	congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘773 patent discloses: “Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." ‘773 patent, 7:39-43. ‘773 patent, Figure 2. The ‘817 patent discloses: “FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below.

	However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
13. The system as defined in claim 1, wherein the WAN is the Internet.	The above contentions for claim 1 are hereby incorporated by reference. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol

	mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘773 patent discloses: “Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." ‘773 patent, 7:39-43. ‘773 patent, Figure 2. The ‘817 patent discloses: “FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP

	protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
14. The system as defined in claim 1, wherein the WAN is a dedicated Intranet.	The above contentions for claim 1 are hereby incorporated by reference. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an

	extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks….” Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. “Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way.” Burchfiel page 250. The ‘773 patent discloses: “Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." ‘773 patent, 7:39-43. ‘773 patent, Figure 2. The ‘817 patent discloses: “FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
24. A method for controlling a system comprising:	"A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
remotely collecting data from at least one sensor;	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13.
processing the data into a radio-frequency (RF) signal;	"FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2.
transmitting the RF signal, via a relatively low-power transceiver, to a gateway;	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102"). "User applications may be any activity suitable for a system which requires data from a wide area to be transmitted to a central control point. " '650 patent, 5:58-6:4. '650 patent, Figure 1.
translating the data in the RF signal into a network transfer protocol;	"Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57.
sending the translated data to a computer, wherein the computer is configured to appropriately respond to the data generated by the at least one sensor by generating an appropriate control signal;	"In systems which cover wide geographical or nationwide areas, many data collection systems may be linked together in a hierarchical or distributed server network, thereby allowing applications located on other computers or networks to access the data from a particular data acquisition device." '650 patent, 5:12-18. "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57.
sending the control signal via the network to the gateway,	"In systems which cover wide geographical or nationwide areas, many data collection systems may be linked together in a hierarchical or distributed server network, thereby allowing applications located on other computers or networks to access the data from a particular data acquisition device." '650 patent, 5:12-18. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57.
translating the control signal from a network transfer protocol into an RF control signal;	"Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57.
transmitting the RF control signal;	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102"). "User applications may be any activity suitable for a system which requires data from a wide area to be transmitted to a central control point. " '650 patent, 5:58-6:4. '650 patent, Figure 1.
receiving the RF control signal;	"The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13.
translating the received RF control signal into an analog signal; and	"The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "The DA 102 can be programmed to periodically (e.g., once a month) read the meters by issuing commands to the I/O device. The I/O device 206 can continuously read the meters or be powered down to conserve energy. In the preferred embodiment, the I/O device is kept in a low power state and activated under control of the DA 102. When I/O device is activated, it reads all of the meters 502, 504, 506 and transfers the measured data to DA 102." ''650 patent, 9:37-45. "Those skilled in the art will recognize that minor changes can be made to the foregoing method. For example, a meter reading may be initiated by the first APP 112 to request data for a billing period. When the APP 112 requests meter data, the DCS 100 sends a command to the DA 102 which in turn commands the I/O device to transfer meter data from all of the meters to its primary cache 202." '650 patent, 10:6-12.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

applying the analog signal to an actuator to effect the desired system response.	"The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "The DA 102 can be programmed to periodically (e.g., once a month) read the meters by issuing commands to the I/O device. The I/O device 206 can continuously read the meters or be powered down to conserve energy. In the preferred embodiment, the I/O device is kept in a low power state and activated under control of the DA 102. When I/O device is activated, it reads all of the meters 502, 504, 506 and transfers the measured data to DA 102." ''650 patent, 9:37-45. "Those skilled in the art will recognize that minor changes can be made to the foregoing method. For example, a meter reading may be initiated by the first APP 112 to request data for a billing period. When the APP 112 requests meter

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	data, the DCS 100 sends a command to the DA 102 which in turn commands the I/O device to transfer meter data from all of the meters to its primary cache 202." '650 patent, 10:6-12.
25. The method of claim 24, wherein the RF signal contains a concatenation of information comprising encoded data information and transmitter identification information from an originating transmitter.	The above contentions for claim 24 are hereby incorporated by reference. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer to peer operation. For example, a user application can issue a command of query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices. This allows server workload to be greatly reduced by allowing it to offload work to the data acquisition device which would otherwise have to be performed by the server. In addition, the offload process can be dynamically altered to suit network performance requirements or to circumvent problems due to equipment malfunction." '650 patent, 5:45-57. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
26. The method of claim 25, wherein the step of transmitting the RF signal is further performed by at least one transceiver, wherein the transceiver is	The above contentions for claim 25 are hereby incorporated by reference. "Another advantage of the intelligent RF transceiver in the preferred

configured to concatenate a transceiver identification code to the RF signal.	embodiment is that it is capable of peer to peer operation. For example, a user application can issue a command of query to one data acquisition device and that data acquisition device can then communicate directly with other data acquisition devices. This allows server workload to be greatly reduced by allowing it to offload work to the data acquisition device which would otherwise have to be performed by the server. In addition, the offload process can be dynamically altered to suit network performance requirements or to circumvent problems due to equipment malfunction." '650 patent, 5:45-57. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.
27. The method of claim 25, wherein the step of transmitting the RF control signal is further performed by at least one transceiver, wherein the transceiver is configured to receive and transmit the RF control signal.	The above contentions for claim 25 are hereby incorporated by reference. "Another advantage of the intelligent RF transceiver in the preferred embodiment is that it is capable of peer to peer operation. For example, a user application can issue a command of query to one data acquisition device and

	that data acquisition device can then communicate directly with other data acquisition devices. This allows server workload to be greatly reduced by allowing it to offload work to the data acquisition device which would otherwise have to be performed by the server. In addition, the offload process can be dynamically altered to suit network performance requirements or to circumvent problems due to equipment malfunction." '650 patent, 5:45-57. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
28. The method of claim 25, wherein the steps of translating and applying the received RF control signal are performed only by an identified transceiver electrically integrated with an actuator.	The above contentions for claim 25 are hereby incorporated by reference. "The system provides a remotely located data acquisition device which may be a sensor or a piece of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-28. "A significant advantage of the program storage is that in combination with the uniform I/O connector interface, it allows a single interchangeable RF transceiver type to be customized to work with a wide variety of devices, such as weather or security sensors, agricultural devices, manufacturing equipment, etc." '650 patent, 5:37-42. "User applications may be any activity suitable for a system which requires data from a wide area to be transmitted to a central control point. For example, in a vineyard operation, each DA 112 could be a sensor device such as a

	weather station or ground water monitor, a unit of active equipment such as fertilizing or irrigation equipment, etc., or a combination of any of these devices. Each APP 112 can be used for a specific purpose such as water monitoring, fertilizing, etc." '650 patent, 6:2-10. "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. '650 patent, Figure 1.
29. The method of claim 25, wherein the network is the Internet.	The above contentions for claim 25 are hereby incorporated by reference. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "Ensuring the appropriate DA 102 communicates with the appropriate APP 112 is accomplished via any suitable identification protocol for communication devices." '650 patent, 6:60-63. "For example, the Internet allows weather data from DAs 102 located

	anywhere to be provided to a single APP 112." '650 patent, 10:54-57. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
30. The method of claim 25, wherein the network is an Intranet.	The above contentions for claim 25 are hereby incorporated by reference. "Ensuring the appropriate DA 102 communicates with the appropriate APP 112 is accomplished via any suitable identification protocol for communication devices." '650 patent, 6:60-63. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
31. The method of claim 25, wherein the network transfer protocol is TCP/IP.	The above contentions for claim 25 are hereby incorporated by reference. "Ensuring the appropriate DA 102 communicates with the appropriate APP 112 is accomplished via any suitable identification protocol for communication devices." '650 patent, 6:60-63. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with

	the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.

	The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
32. A system for monitoring remote devices comprising:	"A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants

	can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
at least one sensor adapted to generate an electrical signal in response to a physical condition;	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13.
at least one wireless transmitter configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a low-power radio-frequency (RF) signal;	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

at least one gateway connected a wide area network (WAN) configured to receive and translate the RF signal, the gateway further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN; and	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. '650 patent, Figure 1. "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57

a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. '650 patent, Figure 1.
34. The system defined in claim 32, wherein each wireless transmitter is configured to transmit a relatively low-power radio-frequency (RF) signal.	The above contentions for claim 32 are hereby incorporated by reference. "The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4.

	'650 patent, Figure 2. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
36. The system defined in claim 32, wherein the gateway translates the encoded electrical signal, the transmitter identification, and the transceiver identification information into TCP/IP for communicating over the WAN.	The above contentions for claim 32 are hereby incorporated by reference. "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "Ensuring the appropriate DA 102 communicates with the appropriate APP 112 is accomplished via any suitable identification protocol for communication devices." '650 patent, 6:60-63.

	"For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	"Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
37. The system defined in claim 32, wherein the WAN in the Internet.	The above contentions for claim 32 are hereby incorporated by reference. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "Ensuring the appropriate DA 102 communicates with the appropriate APP 112

	is accomplished via any suitable identification protocol for communication devices." '650 patent, 6:60-63. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
38. The system defined in claim 32, wherein the WAN is a dedicated Intranet.	The above contentions for claim 32 are hereby incorporated by reference. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44.

	"Ensuring the appropriate DA 102 communicates with the appropriate APP 112 is accomplished via any suitable identification protocol for communication devices." '650 patent, 6:60-63. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249.

	Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
42. A system for controlling remote devices comprising:	"A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices,

	and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA's and stores DA data in the secondary cache." '650 patent Abstract "The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line. Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
a computer configured to execute at least one computer program that generates at least one control signal responsive to a system input signal; said computer integrated with a wide area network (WAN);	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	"For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57 '650 patent, Figure 1.
at least one gateway connected to the WAN configured to receive and translate the at least one control signal; said gateway further configured to transmit a radio-frequency (RF) signal containing the control signal and destination information;	"Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. '650 patent, Figure 1. "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed

	over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57
at least one wireless low-power RF transceiver configured to receive the RF signal from the gateway; said wireless transceiver configured to translate the RF signal to an analog output signal, the wireless transceiver electrically coupled with an actuator; and	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47. "The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this

	figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. "The system provides a remotely located data acquisition device which may be a sensor or a piece of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-28. "A significant advantage of the program storage is that in combination with the uniform I/O connector interface, it allows a single interchangeable RF transceiver type to be customized to work with a wide variety of devices, such as weather or security sensors, agricultural devices, manufacturing equipment, etc." '650 patent, 5:37-42. "User applications may be any activity suitable for a system which requires data from a wide area to be transmitted to a central control point. For example, in a vineyard operation, each DA 112 could be a sensor device such as a weather station or ground water monitor, a unit of active equipment such as fertilizing or irrigation equipment, etc., or a combination of any of these devices. Each APP 112 can be used for a specific purpose such as water monitoring, fertilizing, etc." '650 patent, 6:2-10. "In the preferred embodiment, APPs 112 can access any appropriate DA 102.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "The DA 102 can be programmed to periodically (e.g., once a month) read the meters by issuing commands to the I/O device. The I/O device 206 can continuously read the meters or be powered down to conserve energy. In the preferred embodiment, the I/O device is kept in a low power state and activated under control of the DA 102. When I/O device is activated, it reads all of the meters 502, 504, 506 and transfers the measured data to DA 102." ''650 patent, 9:37-45. "Those skilled in the art will recognize that minor changes can be made to the foregoing method. For example, a meter reading may be initiated by the first APP 112 to request data for a billing period. When the APP 112 requests meter data, the DCS 100 sends a command to the DA 102 which in turn commands the I/O device to transfer meter data from all of the meters to its primary cache 202." '650 patent, 10:6-12.
an actuator configured to receive the analog output signal from the wireless transceiver, the actuator further configured to translate the analog output signal into a response.	"The system provides a remotely located data acquisition device which may be a sensor or a piece of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-28.

	"A significant advantage of the program storage is that in combination with the uniform I/O connector interface, it allows a single interchangeable RF transceiver type to be customized to work with a wide variety of devices, such as weather or security sensors, agricultural devices, manufacturing equipment, etc." '650 patent, 5:37-42. "User applications may be any activity suitable for a system which requires data from a wide area to be transmitted to a central control point. For example, in a vineyard operation, each DA 112 could be a sensor device such as a weather station or ground water monitor, a unit of active equipment such as fertilizing or irrigation equipment, etc., or a combination of any of these devices. Each APP 112 can be used for a specific purpose such as water monitoring, fertilizing, etc." '650 patent, 6:2-10. "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. '650 patent, Figure 1. "The advantage of I/O interface connector 204 is that it provides a convenient standard interface for the attachment of any number of I/O devices." '650

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	patent, 7:24-27. "The DA 102 can be programmed to periodically (e.g., once a month) read the meters by issuing commands to the I/O device. The I/O device 206 can continuously read the meters or be powered down to conserve energy. In the preferred embodiment, the I/O device is kept in a low power state and activated under control of the DA 102. When I/O device is activated, it reads all of the meters 502, 504, 506 and transfers the measured data to DA 102." ''650 patent, 9:37-45. "Those skilled in the art will recognize that minor changes can be made to the foregoing method. For example, a meter reading may be initiated by the first APP 112 to request data for a billing period. When the APP 112 requests meter data, the DCS 100 sends a command to the DA 102 which in turn commands the I/O device to transfer meter data from all of the meters to its primary cache 202." '650 patent, 10:6-12.
43. The system defined in claim 42, the system input signal comprising:	The above contentions for claim 42 are hereby incorporated by reference.
a concatenation of information including data from a sensor, transceiver identification information from the originating transceiver, and transceiver identification information for each transceiver that receives and repeats the RF signal.	"Ensuring the appropriate DA 102 communicates with the appropriate APP 112 is accomplished via any suitable identification protocol for communication devices." '650 patent, 6:60-63. In the preferred embodiment, a complete wireless networking protocol is stored in DA 102 which is capable of supporting both point to point and point to multi-point communications. In addition source routing of messages is included in the stored program to allow the transmission distance of DA 102 to be extended by routing messages across multiple DAs 102. As a result, the user of DA 102 is not required to have extensive knowledge of networking to implement an RF telemetry system." '650. 7:28-37.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	"FIG. 3 illustrates another technique used by the DA 102 to reduce power consumption. This technique uses peer to peer data transfers to minimize the power required by the RF transceiver 210 by reducing the transmission distance required to contact the DCS 100. As shown in this figure, a remotely located DAs 102 (Numbers 1, 2 and 3) transfer data to DA 102 (number 4), which in turn transfers the data to DA 102 (number 5) which then transfers the data to DCS 100. This configuration allows a DCS 100 to receive data from a DA 102 which may be too remotely located to contact it at a low power setting. Those skilled in the art will recognize that the configuration of DAs 102 shown in this figure can be rearranged such that a variety of redundant data paths exist for transfer of data from any particular DA 102 to the DCS 100." '650 patent, 8:45-59. '650 patent, Figure 3. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example, U.S. Patent No. 6,100,817, which discloses "[i]f a message does not fit into the 32 byte Information field, the message is segmented into multiple packets. A segmented message requires a 3 byte NPDU header. Messages fitting into the 32 byte Information field only require a 1 byte NPDU header." '817 patent, 7:61-66.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

46. The system defined in claim 42, wherein the gateway translates the RF signal and the RF control signal into TC/IP for communication over the WAN.	The above contentions for claim 42 are hereby incorporated by reference. "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "Ensuring the appropriate DA 102 communicates with the appropriate APP 112 is accomplished via any suitable identification protocol for communication devices." '650 patent, 6:60-63. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with the teachings of one or more of the additional references teaching this limitation, for example:

	Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250. The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all

	Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
47. The system defined in claim 42, wherein the WAN is the Internet.	The above contentions for claim 42 are hereby incorporated by reference. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "Ensuring the appropriate DA 102 communicates with the appropriate APP 112 is accomplished via any suitable identification protocol for communication devices." '650 patent, 6:60-63. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with

	the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	The '773 patent discloses: "Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." '773 patent, 7:39-43. '773 patent, Figure 2. The '817 patent discloses: "FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1." '817 patent, 6:1-8.
48. The system defined in claim 42, wherein the WAN is a dedicated Intranet.	The above contentions for claim 42 are hereby incorporated by reference. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "Ensuring the appropriate DA 102 communicates with the appropriate APP 112 is accomplished via any suitable identification protocol for communication devices." '650 patent, 6:60-63. To the extent that Plaintiffs contend that this claim limitation is not disclosed explicitly or inherently in the '650 patent, it would have been obvious to a person ordinary skill in the art to combine and/or modify the '650 patent with

	the teachings of one or more of the additional references teaching this limitation, for example: Jubin discloses: "The PRNET can also be accessed from other networks via an Internet gateway." Jubin page 23. Burchfiel discloses: "When some other network is present, it is important to provide connections between the terminals and hosts of the PRN and the terminals and hosts of the other network. This is being done for the ARPANET in two ways: 1. For communications with ARPANET hosts which support a protocol congruent with the PRN connection protocol (the Cerf-Kahn protocol mentioned previously qualifies here), the station functions as an extremely simple gateway: arriving packets are simply forwarded into the other network after their header format is converted to that of the destination network. … 2. The second approach will be conversion between the host-host protocols of the two networks…." Burchfiel page 249. Figure 4, Burchfiel page 249. Figure 5, Burchfiel page 250. "Finally, the PRN TELENT process performs the second type of gateway function described above: conversion between the PRN connection protocol and the ARPANET host-host protocol. Terminals on the PRN appear identical to the terminals attached to the PDP-11, and are able to access remote ARPANET service hosts in the same way." Burchfiel page 250.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	The ‘773 patent discloses: “Providing Gateway Services to the individual Minion devices means that all Minion devices effectively become part of the Internet as shown in FIG. 2. Status enquiries and data messages can originate at any Internet workstation in the world and can be directed to any Minion device." ‘773 patent, 7:39-43. ‘773 patent, Figure 2. The ‘817 patent discloses: “FIG. 3 schematically illustrates a communication protocol in accordance with the present invention. This protocol is explained in greater detail below. However, it may be briefly summarized as entailing use of the TCP and IP protocols for communications among the server 20 (FIG. 1) and the node/collector units 18 (only one of which is shown in FIG. 1.” ‘817 patent, 6:1-8.
49. A system for managing an arrangement of application specific remote devices comprising:	“A customizable data acquisition device (DA) and data collection system (DCS). The DA is remotely located for attachment to a variety of I/O devices, and uses an RF transceiver with a primary cache. A centrally located or mobile DCC with a secondary cache communicates with one or more DA’s and stores DA data in the secondary cache.” ‘650 patent Abstract “The foregoing examples concentrated on utility meter data collection as a method of illustrating general data acquisition and power conservation concerns. However, those skilled in the art will recognize that a variety of applications exist for the collection of data, including industrial, manufacturing, financial, security and agriculture, to name just a few. Industrial processes may require monitoring of materials as they are processed. Manufacturing plants can be designed to control activity and parts delivery on an long assembly line.

	Remote devices such as ATMs can be monitored for maintenance and security. Security systems are needed for monitoring homes and businesses. Agricultural uses include control systems for fertilization and irrigation. As can be seen, data acquisition systems an be used for numerous purposes." '650 patent, 3:1-15.
a computer configured to execute a multiplicity of computer programs, each computer program executed to generate at least one control signal in response to at least one application system input, said computer integrated with a wide area network (WAN);	"In systems which cover wide geographical or nationwide areas, many data collection systems may be linked together in a hierarchical or distributed server network, thereby allowing applications located on other computers or networks to access the data from a particular data acquisition device. By caching the data at the data collection system, substantial improvements in the overall system performance can be achieved. When global networks, such as the Internet, are used to access data acquisition devices worldwide, the use of the dual cache system described above becomes even more advantageous." '650 patent, 5:12-22. "Referring to FIG. 1, this figure shows an overview block diagram of the system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. '650 patent, Figure 1. "Another feature shown by the foregoing figures is the shared hierarchical structure of the system. In particular, the DAs 102 may be shared by multiple

	APPs 112. … Likewise, APPs 112 may reside on a single DCS, or be distributed over a hierarchical network of computers." '650 patent, 8:33-44. "FIG. 3 illustrates another technique used by the DA 102 to reduce power consumption. This technique uses peer to peer data transfers to minimize the power required by the RF transceiver 210 by reducing the transmission distance required to contact the DCS 100. As shown in this figure, a remotely located DAs 102 (Numbers 1, 2 and 3) transfer data to DA 102 (number 4), which in turn transfers the data to DA 102 (number 5) which then transfers the data to DCS 100. This configuration allows a DCS 100 to receive data from a DA 102 which may be too remotely located to contact it at a low power setting. Those skilled in the art will recognize that the configuration of DAs 102 shown in this figure can be rearranged such that a variety of redundant data paths exist for transfer of data from any particular DA 102 to the DCS 100." '650 patent, 8:45-59. '650 patent, Figure 3.
at least one gateway connected to the WAN configured as a two-way communication device to receive and translate the at least one control signal and the at least one application system input; said gateway further configured to translate and transmit a radio-frequency (RF) signal containing the control signal and destination information, said gateway further configured to receive and translate the at least one application system input and source information;	"In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. "Referring to FIG. 1, this figure shows an overview block diagram of the

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	system. The data collection system 100 (hereinafter, "DCS 100") in the preferred embodiment is a server, but may be any suitable system such as a mainframe computer, personal computer, specialized hardware, etc. For ease of discussion, the term processor 104 will be used to describe the primary data processing circuitry. However, processor 104 can be a processor, multiple processors, a microprocessor, an intelligent microcontroller, etc. DCS 100 controls data collection between user applications 112 (hereinafter "APP 112") and data acquisition devices 102 (hereinafter "DA 102")." '650 patent, 5:58-6:2. "Ensuring that the appropriate DA 102 communicates with the appropriate APP 112 is accomplished via any suitable identification protocol for communication devices." '650 patent, 6:60-63. '650 patent, Figure 1. "Likewise, the APPS 112 may reside on a single DCS 100, or be distributed over a hierarchical network of computers." '650 patent, 8:42-44. "For example, the Internet allows weather data from DAs 102 located anywhere to be provided to a single APP 112." '650 patent, 10:54-57.
at least one wireless relatively low-power RF transceiver per computer program configured to receive the RF signal from the gateway; said wireless transceiver configured to translate the RF signal to an analog output signal, the wireless transceiver electrically coupled with an actuator and a sensor;	"The present invention solves the foregoing problems by providing a data acquisition device and a data collection system. The data acquisition device includes a primary cache, a detachable RF transceiver, and a user supplied sensor device. The data collection system includes a secondary cache. The detachable RF transceiver has a programmable controller and an I/O interface capable of attaching to a variety of user supplied sensor devices….Each data acquisition device is capable of peer to peer communication such that data acquisition devices outside of the range of the data collection device can communicate with the data collection device through other data acquisition devices." '650 patent, 3:27-47.

	"The system provides a remotely located data acquisition device which may be a sensor or unit of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-29. "FIG. 2 provides a more detailed block diagram of the DA 102. The DA 102 includes RF Transceiver 210, primary cache 202, program storage 208, microprocessor 212, microcontroller 214, and I/O interface connector 204." '650 patent, 7:1-4. '650 patent, Figure 2. "I/O device 206 can be any suitable user designed unit required for a particular function. For example, it can be a weather station, irrigation equipment, manufacturing equipment, security system, etc. For ease of illustration, this figure illustrates the I/O device 206 as part of the DA 102. However, in practice the DA 102 can be attached directly to an I/O device 206 or it can be remotely attached via cable." '650 patent, 7:9-13. "As shown above, in FIG. 3, the DA 102 is also designed to function as a node in a mesh of RF-communicating devices, relaying information received from I/O devices 206 (which may be sensors or active devices), across the network in a daisy-chain form. Since each node is individually addressable, messages can be routed from source to destination via any number of nodes, without limiting the coverage area." '650 patent, 11:47-54.
an actuator configured to receive the analog output signal from the wireless transceiver, the actuator further configured to translate the analog output signal into a response; and	"The system provides a remotely located data acquisition device which may be a sensor or a piece of equipment which performs a specific active function, such as irrigation in agricultural environments or control of a manufacturing assembly line." '650 patent, 4:25-28.

Exhibit P6 – Invalidity Chart for U.S. Patent No. 6,437,692 based on U.S. Patent No. 5,963,650

	"A significant advantage of the program storage is that in combination with the uniform I/O connector interface, it allows a single interchangeable RF transceiver type to be customized to work with a wide variety of devices, such as weather or security sensors, agricultural devices, manufacturing equipment, etc." '650 patent, 5:37-42. "User applications may be any activity suitable for a system which requires data from a wide area to be transmitted to a central control point. For example, in a vineyard operation, each DA 112 could be a sensor device such as a weather station or ground water monitor, a unit of active equipment such as fertilizing or irrigation equipment, etc., or a combination of any of these devices. Each APP 112 can be used for a specific purpose such as water monitoring, fertilizing, etc." '650 patent, 6:2-10. "In the preferred embodiment, APPs 112 can access any appropriate DA 102. The purpose and timing of each access can vary from APP 112 to APP 112. However, some of the data used by each APP 112 may be the same. Therefore, by caching the data, the DA 102 does not have to regenerate it for each APP 112. This figure also illustrates that APPs 112 can reside within the processor 104 or at a remote location which accesses DAs 102 through the DCS. As shown, remote APPs 112 are connected to processor 104 by client connectors 110 (hereinafter CC 110) via RF links 114 or conventional telephone links 116. Those skilled in the art will recognize that the CCs 110 can be any suitable hardware and software needed to convert received data and commands to a form suitable for the software in the processor 104. The techniques required to implement a CC 110 are well known in the art." '650 patent, 6:11-26. '650 patent, Figure 1. "The advantage of I/O interface connector 204 is that it provides a convenient